FARMERS DIGEST

Volume XX Number 1

35¢

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Published monthly, except June-July and August-September, when published bimonthly at Fort Atkinson, Wisconsin by the Highsmith Co. Inc.

Subscriptions in U. S., U. S Possessions and Canada: One year $3.00, two years $5.50, three years $7.75.

Subscriptions to Other Countries: One year $3.50, two years $6.50, three years $9.25.

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POSTMASTER: Send notice on POD Form 3579 to Farmer's Digest, 81 North Main St., Fort Atkinson, Wis. Entered as second-class matter at the Post Office at Ambler, Pa., July 30, 1948, re-entered at Fort Atkinson, Wis., additional entry at Jefferson, Wis. under the act of March 3, 1879. Printed at Jefferson, Wis

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The Farmer's Digest

Volume 22 August-September 1958 Number 3

"What They Learned About Pigs from the Danes"

Pig Farming, an English farm magazine, took readers on a tour of Denmark. Here's what they saw as they talked "pigs" from morn till night . . .

Condensed from Pig Farming

WHAT can we learn from the Danes? That was the big question in the minds of the 40 English farmers who went to Denmark last June.

They left their farms in England, Wales and Northern Ireland, and spent ten days finding out facts about Danish pig production. The tour took them to commercial farms, demonstration farms and breeding centers. They also visited a bacon factory, a progeny-testing station and a cold store. In fact, they saw the whole pig business from start to finish.

And what did they learn?

A great deal, they went back to their farms confident that there is nothing the Danes do that British farmers cannot do equally as well—*in time.*

Let's take the main facts as they found them.

1. The Danes have only one breed to worry about—a good type of pig with 50 years of testing behind it.

2. They have a simple way of pig-feeding—with standard methods and inexpensive home-mixed rations. Skim milk is not the secret—at 7d (about 8 cents) a gallon it is not economic to use in large quantities for pigs!

3. They have got good buildings. Although put up many years ago, these houses are still satisfactory today. But they now admit that new houses are called

Reprinted by permission from Pig Farming, Lloyds Chambers, Ipswich, England

for—to meet new breeding developments.

4. Their labor is well organized, with much of the work done by farmers' sons, gaining experience on other farms before branching out on their own.

5. They have an advisory service—run by the farmers' unions, not the State—which does a good job in applying the results of research on to the farms.

6. They manage on a profit margin of about 20s-30s ($2.80 to $4.20) per bacon pig.

7. And, lastly, they gain tremendously from agricultural cooperation.

Enlarging on these factors—starting with

Breeding the Pig

The point that greatly impressed our party was the way in which the Landrace breed has been developed—by testing—to produce a long, lean pig that is both a good food converter and a good grader.

The latest progeny-testing report (1956-57) shows that, for the first time since testing started, the average food conversion rate fell below 3.0.

In four years the average backfat thickness has been reduced from 34.3 to 31.2 mm; and during the same period the body length has increased from 934 to 944 mm.

It is considered by Danish authorities that the ideal atlas length measurement is between 940 and 950 mm, which is in line with our own minimum sternum measurement (AA+ pigs) of 800 mm.

Farm families now comprise only 12 per cent of the nation's population, compared with 65 per cent 100 years ago.

Test pigs during 1956-57 graded 91 per cent A (including 11 per cent classified as "very lean"). This was achieved in spite of more stringent classification regulations (new measurement, for "slight of lean," has now been introduced).

One of the 250 accredited pig-breeding centers (which sell about 3,000 boars a year) was inspected by the party.

They found a herd of 18 sows, 2 boars and about 70 young pigs. The quality of the stock was excellent — an indication of the value of progeny testing; each accredited center has to send one group (2 gilts and 2 hog pigs) from each sow to be tested each year.

But whilst the conformation of the pigs was good, the type of weaner seen caused much comment. "They look half starved" was a typical observation. On

this particular farm the pigs were weaned at six weeks old at a weight of around 28 lbs.

It is apparent that Danish producers do not want heavy pigs at weaning. They are not concerned with shortening the fattening period; all they want is a pig that turns food into meat efficiently and produces a grade A carcass—and the time it takes is of little consequence. A period of seven to eight months from birth to slaughter is quite common.

There is strong competition among breeders to become accredited—and remain so. Before they can qualify for this "elite" rank, their herds have to be tested for two years at one of the 16 local testing stations, and only if their stock is then considered good enough can they apply for accreditation. If successful, these breeders then have boars tested at the three main progeny-testing stations, which test over 3,000 pigs a year.

An accredited breeder gets a premium for a boar, (all boars are "booked" a few days after birth), and if the animal later does well under test, then the original breeder receives an extra payment from the purchaser according to the test results. In-pig gilts are also sold.

At the breeding center visited, many of the sows were young, as culling had been fairly drastic to meet the alterations in quality requirements. The average number weaned per litter was 8.9 (the number born per sow per year was between 21 and 22).

The second factor — that of

Feeding —

opened the eyes of many of the visiting farmers.

Not only the scale of feeding, but the actual rations themselves, seemed very much opposed to British practice.

Farmers should aim for a total gross income about double the net earnings they want to make.

To start with, most farmers mix their own rations. Skim milk is little used on commercial farms because of its high price, and in its place a simple protein mix of two-thirds soya meal and one-third meat-and-bone meal is fed, plus minerals (ground limestone and common salt). The cereal ration is mostly barley, but it varies according to the price and availability of grain.

Denmark has introduced the system of feed demonstration farms, both for cows and pigs. These farms are run on commercial lines, but the rations are carefully compiled by feeding experts and put under test. The results are then made known in printed form to the many thousands of fellow farmers who visit

these farms every year.

The fattening pigs are by no means pushed—the aim is to produce good quality bacon at a cheap price.

Danish pig farmers have no great interest in early weaning; they cannot see any advantage in it under their conditions—it is reckoned that it costs 8s ($1.12) more per pig—and in general they wean at about 56 days.

They feed strictly according to weight of the pig, and have no time for *ad lib* feeding, which they consider wasteful.

When questioned on the price of feeding-stuffs they quote world prices—which would work out at about (per ton) 20 Pounds ($56) for barley, 30 Pounds ($64) for soya meal and 40 Pounds ($112) for meat-and-bone meal.

The third factor —

Buildings —

demonstrates how important it is to have a common standard in design. Practically every fattening house inspected was of a traditional pattern, with the familiar central feeding passage and side dung passages. They were well insulated, with massive outside walls and low roofs, and had the same type of ventilation—a large vent and extractor fan, with air inlets (which could be adjusted) in the side walls about five feet above floor level.

It appeared to many of the party that these houses were a shade on the cold side, and in fact Mr. R. Nortoft Thomsen, in charge of Danish pig progeny testing, recognizes that housing is a matter which will have to receive further attention. In his words: "We have bred the coat off the pig, and are now breeding off the shirt (fat). Thus we shall have to design buildings to suit these new developments in breeding."

All pen divisions are made of wood, and appear to have stood up to wear and tear remarkedly well. Many piggeries had swinging pen-fronts, and simple farrowing crates, with one side movable, were also in common use.

Out of the seven farms visited only one had installed water-bowls—and it was on this farm that the "bloom" on the stock was the subject of much favorable comment. Incidentally, this was the one farm on which proprietary creep-feed pellets were used.

The individual feeding of sows in stalls is a general practice, as much importance is attached to correct sow-feeding and management. Special experiments are carried out in this respect at the demonstration farms.

Novel housing designs were found in a round house for pigs from weaning until drafted into the fattening house, and in an adapted double-storey building

with pigs on both floors—the sows are winched upstairs in a crate!

To deal with other factors in Danish pig production,

Labor —

Work was normally arranged so that on most farms one man looked after the livestock, and the general policy was for him to work until all his daily tasks were finished—with no overtime paid.

On one farm of 100 acres, which carried 25 dairy cows and on which 500 pigs were fattened yearly, the stockman was paid a wage of 325 Pounds ($910.00) per year. He boarded with the family—the usual practice with single men.

In many parts of Jutland a farmer hires men (usually farmers' sons) on a yearly basis.

In general, wages are on a parity with those in this country, but there is no Wages Board and no 47-hour week in Denmark.

The

Advisory Service

throughout the country is of a very high standard. As the majority of the advisers are employed by the farmers themselves, they are very keen to spread their knowledge over as wide a field as possible.

They are greatly helped by the demonstration farms, of which there are two (one medum-sized and one small) in each of the nine pig-breeding districts into which the country is divided. As one adviser put it: "These farms shorten the road from experiments to the farm."

It was felt, however, by some members of the party, that too much reliance upon the advisory service was apt to sap the farmer's initiative. Nevertheless, the system has a good deal in its favor.

On the matter of

Farm Income

it appears that the Danish producer receives about 12 Pounds 10 shillings ($35.00) for a baconer, plus a dividend of around 18s ($2.50) on each pig that grades A.

On those farms that do no breeding, it costs about 4 Pounds 5s ($12.00) to buy in a 10-week old pig. This leaves about 9 Pounds ($25.00) for feed, labor, vet's fees, depreciation — and a profit. At the present time many producers are only making about 20s ($2.80) on each pig fattened.

On the 100-acre farm referred to previously the farmer — an owner-occupier — fattened 500 bought-in weaners, sold milk from a 25-cow dairy, and grew sugarbeet, fodderbeet, peas, barley and rye. His yearly income (after paying all rates) was 1,300 Pounds ($3640). Deducting the 30 per cent land tax he pays, this

left him with a net return of 867 Pounds ($2427) per year. His total farm sales were close on 10,000 Pounds ($28,000) a year.

The last factor mentioned in this article —

Co-operation

is an immense subject in itself. It dominates the whole of the farming system, and contributes in no small manner to the reduction of production costs. It forms a pattern which many of the visiting farmers considered could well be developed in Britain.

Fence Posts

Years ago fence posts lasted longer than they do now. The reason, according to E. J. Lott, Purdue University extension forester, is that "old timers" split their posts and rails from old trees which had a high percentage of heartwood (hard, central part of the trunk).

The durability of posts, Lott says, depends a lot on the percentage of heartwood they contain. The more heartwood, the longer the posts last. Posts made of some tree species last considerably longer than those made of others. Posts made of Osage orange, for example, may last 40 years or more. Black Locust posts often last 30 or 35 years. Red Cedar and Mulberry last from 25 to 30 years and White Cedar, Catalpa and White Oak last from 12 to 20 years.

Heartwood doesn't increase durability, however, when it comes to posts treated with preservatives, according to Lott. In fact, just the opposite is true. Posts and timbers with wide bands of "sapwood" (soft, fast-growing wood) absorb larger quantities of preservatives than those with much heartwood.

Well-seasoned sap pine posts or any native sap woods, with bark removed, are satisfactory for preserving treatments, Lott says. Pressure treatments are most satisfactory, and can increase durability from 25 to 30 years. Such treatments force chemicals into the wood under pressure.

Cold soaking treatments can increase the life of posts from 15 to 20 years, according to Lott. Posts which are to be cold soaked should be peeled first and properly seasoned.

If additional information is desired, Lott suggests that farmers write to the forestry department at Purdue University, West Lafayette, Indiana, for extension leaflet 300 "Preserve Your Posts With Penta" and extension bulletin 283 (revised) "How to Select Wooden Fence Posts." —*Indiana Extension*

Must We "Subsidize" Cotton Exports?

Nearly half our cotton crop is being sold to foreign countries at less than the farmer gets for it. Is it necessary?

Condensed from Farm and Ranch

Bob Nichols

AS WITH nearly all other crops, the trouble with cotton is that we're growing more of it than we can use in this country. But cotton is worse off than other crops; we're using less and less of it ourselves.

Last year, we used only 8,600,000 bales; the year before it took 9,200,000 bales to supply our own mills.

But our present acreage allotments—in an average year—will easily give us a national crop of from 12 to 15 million bales. Unless we export those "surplus" millions of bales, we'll soon have cotton running out our ears. Or —under present acreage control laws—we'd have to cut acreage allotments drastically.

But foreign buyers shy away from our cotton when they think it's priced too high. In 1955-56 —when it *was* higher-priced than cotton from most other countries —they bought only 2,200,000 bales of American cotton. Surplus cotton was piling up in government warehouses fast.

Then our export sales program for cotton got under way. During the first year, the government-financed export program moved more than 7,750,000 bales out of American warehouses into foreign markets — and began whittling down Commodity Credit Corporation stockpiles fast.

The export sales program costs money. During its first year, cotton was moving out of CCC stockpiles at a selling price averaging about $125, about $35 a bale less than CCC had invested in it. Since then, lower support prices have cut CCC's cost per bale.

But the cut-rate price isn't all the program costs. Only a part of the export sales of cotton and other crops are for good old American dollars.

A lot of the sales are made for the currency of the country that's buying—Indian rupees, for

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example, and Yugoslav dinars and Italian lire. And the foreign currencies can't be converted back into dollars; they must be spent in the countries where we get them.

Some of the lire and dinars and pesetas turn out to be almost as good as dollars, because our government uses them to pay costs of our overseas military installations and embassies in the country where they're acquired.

When a cow bloats, you can give her temporary relief with a broomstick cut 12 inches long and fastened like a bit in the animal's mouth. Chewing on the stick stimulates belching.

But most of the money—more than half of it—is "lent" back to the purchasing countries for their economic development—building roads, dams, etc.

Supporters of the "subsidized" export program say that we'd be handing out money to these countries anyway, in foreign aid—and this way we aid them and ourselves, too.

Not all of the export sales involve money; some are for barter—swapping surplus crops for strategic materials we need from the purchasing countries.

From January 1, 1955, to April 1 of this year, our government shipped or made agreements to ship 3,159,000 bales of cotton to foreign countries in exchange for their currencies. The total value of the cotton was $488,000,000. The balance of the cotton sold under the export sales program was for dollars or in barter.

The exact cost of the cotton export sales program to the taxpayer will probably never be known. The figures are lost in the red tape of governmental bookkeeping — transfer of funds from bureau to bureau—and the nonchalance of most foreign countries about repaying "loans."

But what about the cost to the cotton grower? Are "subsidized" export sales hurting the cotton industry? Most cotton brokers, shippers and ginners—and some Arizona-California growers — say they are. They want a "competitive, one-price" program, with enlarged acreage allotments or complete removal of acreage controls.

Most growers in the rest of the Cotton Belt can't see it that way. A really competitive price would bring growers no more than 25 cents for Middling 15/16-inch cotton, according to a recent Congressional committee report. Present support levels will make the same cotton worth about 31.36 cents this year. Last year it was about the same.

Naturally, not many small growers want to take a voluntary cut of six cents a pound or more just to make cotton completely

competitive against synthetics and foreign producers.

National Cotton Council's economist M. K. Horne, however, predicts that once American cotton prices become fairly well stabilized we could still sell enough cotton "competitively" without having to have such extreme cut-rate prices.

Texas Cotton Growers Association and several other grower groups are backing a Farm Bureau compromise plan aimed at moving cotton into export markets out of *current* production—instead of letting CCC and privately-owned stockpiles monopolize export channels.

The Farm Bureau plan calls for continuing export sales on a competitive bid basis, as they're made now. But it would add a direct subsidy program so Uncle Sam—instead of growers—would stand most of that loss of six cents or so a pound.

Under the plan, however, growers would have a choice of getting a larger acreage allotment and taking a *lower* support price, which would be closer to the "competitive" price.

Farm Bureau's proposal is to keep surplus cotton in CCC stockpiles — instead of crowding current-crop cotton out of the export markets — until it's really needed to fill foreign demand.

Secretary Benson — who has been dedicated to whittling CCC stockpiles as small as possible, and keeping them that way, wants to get rid of CCC stockpiles *first.*

The Farm Bureau plan is still an export subsidy plan; it doesn't propose ending government controls, and it doesn't forsee anything except keeping Uncle Sam as the price and supply regulator. The same is true with nearly every other proposal that has been made — except Secretary Benson's

A mature tree loses a lot of water every day through its leaves, and may need 500 pounds of water to grow one pound of dry weight.

Texas Cotton Ginners' Association, for example, calls for a "competitive, one-price" program for cotton. And the association's platform calls for "getting the government out of the cotton business"—but not too far out!

The group wants the government to keep on subsidizing the cotton industry—with something like Texas Representative Poage's Compensatory Payment Plan.

The Compensatory Payment proposals—by Poage and others —would permit cotton to be exported out of privately-owned, current-crop stocks.

The cotton would sell for less than growers got for it—at whatever price was necessary to com-

pete with foreign growers. Uncle Sam would make up the difference.

It would be something like the "incentive" program now in effect for wool—but wool is a "deficit" product and we don't produce as much as we need in this country.

25 years ago, size sixteen was the most popular woman's dress shoe. Now it is size 12.

Supporters of the compensatory payment idea want it to help *increase* cotton acreage in this country—and the amount we'd have to export.

The outlook is that we could sell more cotton than we're now producing — at least 15 million bales (domestic plus export use) next year, and more in future years—without a complicated export subsidy program, if growers could stand to take a lower price for their cotton.

Few of them (except big-scale growers, particularly in Arizona and California) think they could. And hardly anybody claims to have the "perfect" answer to the problem we have for nearly all crops: how to get foreign countries to help us use up our surplus.

Unless growers *could* accept lower prices for the crops they sell, the alternative is to keep on asking each session of Congress for money to pay for subsidies of one kind or another—at least for exported crops.

And with Congress increasingly unfriendly to farm appropriation requests, who knows when the *next* session of Congress is likely to balk—and leave cotton and other crops in the lurch?

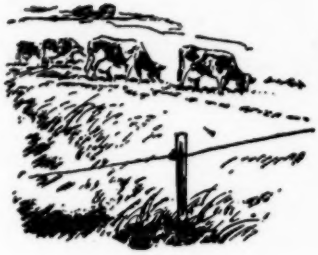
New Drug for Vets

Veterinarians will soon have a new drug to attack cases of infection in cattle and other farm animals which do not respond to ordinary treatment. It is called varizyme.

The drug is injected into the blood stream or muscles of animals and breaks down the "disease barrier" which is a wall around infections. The wall prevents antibiotics and other medications from reaching the infection. Once the wall is removed the drug can reach the infection.

Cures have been obtained by this new drug in cases of chronic foot rot in cattle, swollen hocks in dairy cattle, wire cuts, nail punctures, and joint infections in horses. It has also been effective in acute cases of mastitis in dairy cattle, infection under the jaw and stubborn local infections. —*South African Dairyman, Johannesburg*

Strip Grazing Gives More Milk



Wisconsin dairymen say you need one-third less pasture . . .

Condensed from Wisconsin Agriculturist

Lloyd Zeman

FARMERS who haven't yet tried strip grazing may want to give it a whirl for pasturing second crop. It's almost a sure way to get more pounds of milk per acre.

Some 650 farmers in Wisconsin who have used this method for three years or more, have found that pounds of milk per acre can be increased considerably by rotational grazing. More than 10 per cent report a yield of better than 4,000 pounds of milk per acre.

Ray Hilt, Dodge county, had an everage yield of 4,675 pounds of 3.5 per cent milk from each acre of pasture last summer.

To produce this amount of milk, the pasture yielded over 2 tons of digestible feed per acre. That's equivalent to 180 bushels of oats, 85 bushels of corn or 4 tons of hay.

Hilt's 30-cow herd was pastured on 12 acres for 109 days. All but 1½ per cent of the total feed intake of the herd was provided by the pasture.

Feed Extra Grain

When available, it's a good idea to feed hay or silage as well as concentrates to cows on pasture. This gives them the extra energy they need to produce high yields of milk.

Sheboygan (Wisconsin) county agent, Glen Lycan, says that moving cows on pasture frequently, increases the amount of feed for the cows to consume. "Pasture acreage can be reduced at least a third when twice a day rotation is practiced," he says.

Last year the average value of milk produced per acre of strip grazing in Sheboygan county over and above the cost of supplemental feeds was $128.60. The year before, when weather conditions were more favorable, that

Reprinted by permission from Wisconsin Agriculturist and Farmer, Racine, Wisconsin

figure was $148.

The size of the pasture will depend upon the size of the herd, the length of time of each grazing and the condition of the pasture. Usually a small pasture and once-or twice-a-day rotations are best.

Lamb accounts for only two per cent of the 33 billion lbs. of meat consumed in this country. Beef tops the list at 43 per cent with pork following at 34 per cent, poultry at 16 per cent and veal at five per cent.

A good rule of thumb is to pasture 50 cows per acre per day if stands are in good condition. When a stand is weak or growing conditions are not favorable, it may be necessary to increase the acreage or reduce the grazing time on each area.

Sheboygan county farmer, Henry Johanning, pastured 60 head of cattle for 37½ days on only 8 acres last year. He rotated pastures twice a day.

"You might think that moving a fence twice a day takes too much time. I do it in less than 10 minutes," Johanning states.

He divides a field into five or more sections, depending upon the size of the field and condition of the pasture. These fences are a single electric wire and are left in place all season.

Then a movable electric fence is put across the field. For this he uses enforcing rod posts and a smooth wire.

To move the fence, Johanning simply slips the wire out of the post loops and slides the wire a few feet ahead on the divisional fence.

Then he moves the posts and re-attaches the wire. Since the posts are less than a third of an inch in diameter, they can usually be pushed in the ground with very little effort.

A 50-50 mixture of grasses and legumes makes a highly desirable pasture. An alfalfa, brome and ladino mixture usually is best.

Since half legume and grass mixtures are most likely to be found in the older stands, fields that have been in hay for two years or more are the best place to start an intensified rotational grazing system.

The ideal time to put cows on a legume pasture is just as it approaches the bloom stage. However, earlier grazing may be necessary if all pastures are to be used to greatest advantage.

If growing conditions are favorable, some of the pasture may get ahead of the cows. When this happens, a portion of the pasture should be cut for hay or silage.

A field usually needs a 3 to 4 week recovery period before it can be regrazed. Longer recovery

periods are required later in the season when growing conditions are less favorable.

Stay Off Wet Fields

When new seeding is grazed, care should be taken not to let animals on the field if it is very wet. Cattle tramping on muddy fields can cause great damage to both the stand and soil.

A good application of phosphorus should be applied at seeding time. Since phosphorus takes time to break down, it needn't be applied as often as potash.

Johanning fertilized a 2-acre strip with 1,000 pounds of 10-10-10. The field provided nine days of pasture and yielded 9,450 pounds of milk. In comparison, a 2-acre strip not fertilized provided six days of pasture and yielded only 6,300 pounds of milk.

Since Johanning's Jersey herd had a 5.2 per cent butterfat test while on pasture, the increase in production on the fertilized pasture is valued at $138.28. Subtracting $20, half the cost of the fertilizer, the net gain through fertilization is $118.28.

With strip grazing, as with conventional pasturing, remember to keep salt and water available in the pasture area.

Cows having to walk a great distance for water waste energy. Also, they eat less as they aren't apt to return to the pasture area until they become hungry.

Bentonite Cuts Down Water Loss in Ditches

Lining irrigation ditches with bentonite—using a method fairly new in Wyoming—shows a great deal of promise as a low-cost but effective way to cut irrigation water loss, says Mike McNamee, Wyoming University extension engineer.

In this method—called the dispersion method—workers stir finely ground bentonite, a type of clay, in the ditch water. Water carries the bentonite solution through the ditch and into every seep however small.

The bentonite penetrates the sides and bottom of the ditch and fills in the openings. The result is a deep seal not easily disturbed by frost, water, or light cleaning.

Cost of the seal varies with soil conditions and the amount of ditch treated. In tests, the cost has ranged from 5 to 40 cents a square yard—considerably less than the cost of other types of permanent ditch lining in common use.

How Much Can You Pay for More Land?

Follow these steps and figure a practical value before you add more acres to your farm . . .

Condensed from Crops & Soils

EIGHT mathematical steps can help you answer the question: How much can I pay per acre for more land? This formula, developed by USDA researchers, will determine annual rent or purchase price.

Agricultural economist V. L. Hurlburt devised a procedure using information from individual farm account books. If successful farming practices are followed, and if there is no over- or under-investing, you may use annual costs and returns from your own business records.

Based on Present Value

You must estimate the value of your present land and buildings before figuring the maximum price to pay for additional acreage. Assume your farm has 190 acres used for rotational crops and 10 acres of building lots, waste, and roads, or a total of 200 acres valued at $45,000 (the market value of the property if you sold today).

Hot weather causes milk to test lower in butterfat. Tests show that for each 10-degree temperature drop between the limits of 30 and 70 degrees, fat increased almost two-tenths of one percent.

To determine actual crop costs and returns, you should separate your crop and livestock enterprises on paper. Include labor, machinery, and other costs represented in both livestock and crop production as part of crop operations.

Then follow these eight steps to determine what you can af-

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ford to spend for renting or purchasing land:

1. Add values of all crops produced during the year. Pasture may be figured at hay equivalent. Let's assume the value of all crops is $12,656 for the past year.

"The Disaster Cellar" is the title of a recently released Texas publication. It covers in detail how to build a storm or tornado cellar and other items that should go into the overall planning. Copies are available from the Agricultural Information Office, College Station, Texas.

2. Figure average value of produce per acre. Divide the value of crops ($12,656) by the number of rotation acres (190), omitting roads, building lots, and waste. The answer ($66.61) is also the estimate of additional returns from adding one equally productive acre. Adjust for any wide difference in soil type or topography between present land and the property that is under consideration.

3. Add variable costs of crop production. Add the estimated cost of your own and your family's labor, if it is not already in the accounts. Add costs of farming practices, assuming the same system is to be used regarding rotation, seeding, fertilization, cultivation, and cropping. (Fixed costs are ignored.) Let's say your variable costs total $4,360.

4. Obtain average variable cost per acre. Divide total variable costs ($4,360) by number of rotation acres (190) to find variable cost per acre ($22.95).

5. Estimate annual cost per acre of added land. Divide current market value of land and buildings ($45,000) by total number of acres (200). The answer ($225) is the market value per acre. To reduce the per-acre value to annual cost, add 1 per cent to the farm-mortgage interest rate and multiply the result by market value per acre (1 per cent plus 5 per cent, or 6 per cent, times $225 equals $13.50 annual cost per acre of land to be acquired).

6. Determine rate of return on each dollar invested. Add the cost of the land per acre ($13.50) to the variable costs per acre ($22.95). Divide this total cost ($36.45) into the average value of the product per acre ($66.61) to determine the rate of return on each dollar invested. The per-dollar rate of return in this case is $1.827.

7. Determine maximum annual rent—that is, rate of return on each additional acre. Multiply the cost of the land per acre per year ($13.50) by the dollar rate

of return ($1.827). The most rent this operator can afford to pay for additional land is $24.66 per acre annually, assuming that the returns will be the same as for present operations.

"The feeling that you have done a job well is rewarding; the feeling that you have done it perfectly is fatal."

8. Determine maximum purchase price per acre. Add mortgage interest rate plus another percentage for risk and divide into annual rent (5 per cent plus 1 per cent, or 6 per cent, divide into $24.66). The answer is $411. Although the average price per acre of the farm, in this case, is $225, the operator could afford to spend as much as $411 for an additional tillable acre to add to his property.

Allow for Inefficiency

A less efficient farmer couldn't pay $411. If, for example, you had only a $13.50 rate of return on each additional acre instead of $24.66 you could not spend more than $225 per acre ($13.50 divided by 6 per cent). On the other hand, if you are efficient enough to obtain $30 per acre, you could spend as much as $500 ($30 divided by 6 per cent) and still break even.

Engineer Forecasts Higher Power Take-off Speeds

Tractors with a power take-off speed of 1,000 revolutions per minute may be on the way soon, predicts O. J. Trenary, Colorado State University.

The standard for 35 years has been 540 revolutions for power take-off drives. But mandatory design changes and other improvements have convinced engineers that a higher speed take-off is desirable.

Trenary believes that manufacturers soon will include this change in their new models, together with conversion units to adapt the new speed to machines designed for use with the old, slower take-offs. The higher take-off speed is particularly helpful in operating units such as irrigation pumps and electric generators.

Some reductions in manufacturing costs also may be possible. Standard specifications for the new speed unit have been approved by the American Society of Agricultural Engineers.

—Colorado State University

Now, Green Chop for Beef Cattle

Compared to pasture, it gives more feed of better quality. Result is more beef per acre . . .

Condensed from The Farmer

Thomas A. Doughty

DAIRY farmers aren't reaping all the benefits from "green-chop" or "zero pasture" programs. Beef feeders are adopting the new practices, too.

"It's almost unbelievable what a difference daily green-chop feeding has made in the acreage needed to feed the same number of cattle as on pasture," said Merton Roske, Renville County, Minn. He has used the system four years, with one acre of green-chop brome and alfalfa carrying up to six head of steers through the summer, plus extra hay baled from the green-chop acreage. With an open pasture system, he figured two head per acre was doing good. Last year, he fed 400 head green-chop. A few years ago, he had less than 75 head on pasture.

Down the road, Gene and Harold Tisdell say the same for green-chop. To them, like Mr. Roske, it has meant a way of increasing their beef herd without additional pasture acreage. Last year, 40 acres of daily green-chopped brome and alfalfa carried 268 head of fattening cattle from late May to early September, plus a cutting of 450 bales of hay from the same acreage. This year, the brothers will feed 280 head green-chop from 40 to 45 acres. Five years ago, they were starting the beef business with 30 to 40 head.

Feed Forage Year Around

Cattle on both farms are fed heavily on forage the year around before being finished on corn for "hardening." Corn silage, oats silage and hay make up their winter forage rations, and green-chop in the summer. They also feed around a pound of corn (shelled corn basis) per hundred pounds of body weight daily during the growing period. The corn is increased gradually a few weeks before full-feed finishing time, and the forage decreased.

Both Mr. Roske and the Tis-

Reprinted by permission from The Farmer, St. Paul, Minnesota

dells have added antibiotic and vitamin premixes to their protein supplements. And, for the first time, their steers were implanted with stilbestrol this spring. The Tisdells reduce protein to a half pound per head daily when feeding green-chop. Mr. Roske feeds a quarter pound of protein daily on green-chop, but feeds a pound daily of the mixed supplement to his feeder calves during winter, and up to two pounds when they are on full grain the following fall. "The droppings always are a good indicator of what's needed," he commented.

"We figure our daily gains on green-chop are as good as on silage," said Mr. Roske, "and we've always had better gains on good silage than on open pasture. Our cattle are finishing quicker each year, but the benefits of feed additives, green-chop, and better silage all are factors hard to measure individually. However, we estimate our daily gains at two pounds-plus."

The Tisdells checked rate of gain last year on 10 head of steers. Weighed gains averaged slightly more than two pounds per head daily during the first part of the green-chop season, or about the same as the steers were gaining on corn silage during spring. But, gains fell slightly below two pounds when hot weather came in July.

"We're able to watch our cattle closely, with the lot-feeding system," explained Gene Tisdell. "We've had no bloat problem. The cattle have water at all times and we keep green-chop in front of them day and night. We start them out slowly—mixing some of the green-chop in with corn or oats silage we have left in our trench silos. We also get the chopper low enough to get some of the remaining oats stubble. This all seems to help get them started without trouble."

Mr. Roske also has experienced no serious bloat problem on the green-chop system. "A few of our cattle have blown up, but I have not had to treat a one in four years," he said. "They've gone down of their own accord. We start cautiously, but keep them full at times, never letting them get real hungry. We keep dry hay in a rack, and the green-chop is fed in fence line bunks, with 2¼ feet of space per head."

Use Self-Unloading Wagons

Both farms use self-unloading, grain-forage mixing wagons to unload the green-chop and grain-supplement into the bunks. They use the same system for silage feeding. Grain and supplement are put on top of the load and mixed in as the box is unloaded. Their choppers are set at fine-cut (½ to ¾-inch) and left that way for oats and corn silage.

"It took us 2¼ hours a day last year to green-chop four big loads and unload them for 400 head," pointed out Mr. Roske. "But, it takes us that long or longer to feed the same number of cattle from the silo, even with an unloader."

The cattle feeders do not leave the green, fresh feed set in the wagons during the day because of the rapid heating that can occur. The Tisdells chop one load in the morning and another in the evening, then distribute it evenly in the bunks. Mr. Roske chops only in the morning, but fills the bunks only for one day's feeding.

Rainy weather, even last year's torrential downpours, hasn't seriously interrupted their feeding systems. Their cattle aren't without the green feed once the system is started.

"We reserve some of the high ground for chopping during a wet spell; load what we can and go back for more if needed," said Gene Tisdell. "If the field is too wet for a full load, we can always mix in some chopped, dry hay," added Mr. Roske, but there usually is enough tall grass in our lots around the buildings that can be chopped, too. This is one way of getting rid of it."

The cattle feeders agree that the green-chop system does take extra labor and equipment expense, compared with pasturing, and it requires different management know-how to keep it clicking. However, in both cases, equipment already was available for silage making and feeding.

A day's meals cost each American an average of $1.20 in 1957. This $1.20 per day equals 25 per cent of the per capita disposable income.

William (Bill) Behrends, Redwood County, Minn. cattle and turkey feeder, has tried three systems of summer feeding the last few years: rotational grazing, green-chop feeding and "zero pasture" (feeding from the silo the year around).

Like the above feeders, Mr. Behrends found that green-chop feeding greatly increased the amount of feed per acre, reduced bloat, and improved daily gains over grazing. But, because field work and several thousand turkeys to care for crowded his time, he eliminated the daily chore of green-chopping, and put his cattle on a year-around silage diet.

"We can put our forage in the silo all at one time and at uniform quality," he said. "There may be some seepage and fermentation loss from the silo that we didn't get with green-chop, but our gains have been equally

as good. A preservative helps hold the quality. We've had no bloat losses from either green-chop or silage feeding, but we did have them on pasture."

With four upright and two bunker-type silos, Mr. Behrends has plenty of silage space. During winter and spring, he feeds a mixture of corn silage and oats silage, plus grain and supplement (including stilbestrol and Terramycin). The silage is dropped from the uprights by silo unloader into a mixing-feeding wagon. Grain and supplement are put on top and the mixture distributed in fenceline bunks. Last summer, he had enough of this type of feed held over for the whole summer. His hay then was chopped and dried, or baled.

Grass Silage for Summer

This spring, he will finish emptying one of his bunker silos just in time to refill it with grass silage for summer feeding. The cattle will have access to the bunker via a self-feeding gate. Grain and supplement will be fed in the fenceline bunks. He'll refill his upright silos with oats silage, corn silage, and ear corn silage for feeding after the grass silage is gone. His cattle aren't taken off silage, but grain is increased toward finishing time.

"Feeding the grass silage from the bunker takes only a few minutes time every other day to adjust the gate forward," explained the feeder. "We start feeding it right after filling. Our spoilage amounts to very little. Our cattle get used to a silage diet and like it. We've had no trouble with cattle overeating or going off-feed. Our gains have averaged two pounds or better daily."

Harvest Loss Can Cut Corn Crop 20%

Some corn growers leave a fifth of their crop in the field after picking. Elmer Rossman, farm crops specialist at Michigan State University believes harvest losses with mechanical corn pickers average 10 per cent of the crop with some losses as high as 20 per cent.

The main trouble is, Rossman says, that many picker operators judge the efficiency of harvest by the cleanness of ears from husks. This is a mistake because attached husks do not interfere much with storage and there is no discount for a few husks when corn is sold. In fact, to get ears clean of husks, shelled corn losses will run high.

Picker operators should look on the ground for shelled corn and missed ears to judge the job they are doing rather than worrying about husks on the ears.

—Michigan State University

Silage Made In a Mound

A Yorkshireman has a go at the simplest kind of a silo . . .

Condensed from Dairy Farmer (England)

John Rowntree, Hilla Green Farm

WHEN the silo grant first came to England the advisory officer tried to persuade me to have a go.

Rightly or wrongly I decided against his advice. Not that I dislike silage—on the contrary I am a confirmed silage addict—but the milk cheque keeps getting smaller and the grant covers only part of the cost.

Instead I made self-feed mound silage. However, being a cautious Yorkshireman, I decided to try it on some outwintered stores, before possibly reducing milk yields. It may interest other dairy farmers to know what happened.

We chose a well-drained corner of a grass field adjacent to the meadow scheduled to produce the silage. On June 24th we began to cut the grass and make the mound.

By Buckrake

The grass was carried by buckrake and dumped on the site. As the mound grew higher it was, of course, necessary to make it wider, so that the tractor could climb on top.

While the tractor driver was collecting the next load, my other assistant spread the grass evenly over the pile. As each load was delivered the tractor approached from a different direction so as to get even compression.

The operation took about four hours a day, including the grass cutting; in addition I spent half an hour or so rolling the mound with a tractor in the evening.

Altogether eight acres were ensiled—about 35 tons—in 20 days. No covering was used, but the mound was gone over with the tractor until the surface was smooth and slimy, well-compressed and sloping evenly in all directions so that rain could run off easily.

June 24th may seem late to start silage-making, but it was a cold dry spring and a late season. Also we had already filled a pit with a younger vintage for the cows. In addition I had been advised against ensiling too-young

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grass for self-feed, because it gets so compressed that it is difficult for the cattle to pull it out of the clamp.

Nineteen bullocks and heifers started to eat the silage on January 1st, and it lasted them until March 15th, which means that, allowing for waste, each animal got about 45 lbs. of silage a day on average, supplemented by a good deal of foggage from the field. However, for some thirty days the ground was under snow.

Corncobs have about three-fifths of the feeding value of shelled corn, according to animal nutritionists.

I had been led to understand that the cattle would eat the silage evenly from the top. What they actually did was to eat straight down until they had got to the bottom. Then they ate their way out to the edge of the mound. At this stage, having made a "face," they turned round and ate steadily through to the other side.

The finished mound of settled silage was 4½′ high at the center with a diameter of 40′. Wastage only amounted to about 6″—except at the edge, where it was considerable. But although the base of the mound was not reinforced in any way and there was a lot of mud, very little silage was wasted on that account.

Analysis of the silage, in comparison with our pit silage, was:

	Pit		Mound	
	% fresh	% dry	% fresh	% dry
Dry matter	27.0	100	26.3	100
Crude protein		17.1		10.0
Crude fibre		25.9		31.8
Digestible crude protein	3.15	11.7	0.85	3.3
Estimate S.E.	15.1	56	11.3	43
pH	4.0		4.2	
	Well-made silage of very good feeding value.		Slightly overheated silage of super-hay feeding value but low in protein.	

The low-protein content of the mound silage was, of course, due to the late cut, otherwise there is not a great deal of difference.

So much for the results. What of the snags?

The cattle, having made a face, started to eat from the bottom, which was probably the best silage, and tended to undermine the top layer. As a result it was necessary to cut the overhang away each day.

Evaporated milk is good cow's milk which has been concentrated to double richness by taking away some of the water; nothing has been added to it.

Also in frosty weather the surface became too hard for the cattle to get their teeth into it, and again a certain amount of paring had to be done with the silage knife.

However, neither of these operations took a fraction of the time that would have been need-

ed to cut the silage out and carry it to the stock. But the stock have, of course, made rather a mess of that corner of the field.

As for the cattle, most of them came through the winter in good store condition. A few that were under two years old did not fare so well, and would have done better with some supplementary feed.

On the whole the experiment has been successful. It has saved a lot of labor and, for strong stores, the system works quite well.

For dairy cows, in this part of the country, it would probably not give such good results. Unless they had unrestricted access to the mound day and night, I doubt whether they would eat enough. And the out-wintering of dairy cattle is not, in my opinion, a feasible proposition in the north.

Penalty Rate Set for 1958 Excess Wheat

The U.S.D.A. announced a marketing quota penalty rate of $1.09 per bushel on "excess" wheat of the 1958 crop.

As directed by law, the rate of the marketing quota penalty is 45 per cent of the parity price per bushel of wheat as of May 1 of the calendar year in which the crop is harvested. The current parity price for wheat is $2.42 per bushel.

Growers approved marketing quotas for the 1958 wheat crop on June 20, 1957. When wheat marketing quotas are in effect, a farmer who does not comply with the wheat acreage allotment established on his farm is subject to a penalty on his farm marketing excess, unless he harvests 15 acres or less or has signed an agreement permitting him to produce up to 30 acres of wheat for feed use on the farm.

Wheat produced on a farm having a farm marketing excess is not eligible for price support.

The national average minimum support price for 1958-crop wheat is $1.78 per bushel, which was 75 per cent of the April 1957 parity price with a transitional adjustment. The final average support price for the 1958 crop will be 75 per cent of the effective parity as of July 1, 1958, if this is higher. —*New Mexico News*

Latest on Bunker Silos

Many farmers have cussed them, but now we know how to lick the problems. Follow the recommendations in this report . . .

Condensed from Successful Farming

Roy M. Van Arsdall, U.S.D.A.

FIVE YEARS ago farm experts were saying that horizontal silos were good for *emergency* storage of forage crops—but were *temporary* measures at best.

What about today?

1. This is still largely true of *stack* silos—even though plastic covers may help to bring spoilage within acceptable limits.

2. Walled and floored *trenches* make good silos and are adequate if a site convenient to the feedlot is available. But on most Midwest farms the lay of the land does not permit this type of silo to be located at the farmstead.

3. The bunker silo is a different situation. A properly constructed bunker silo:

- Is a permanent and durable structure.
- Costs less than an upright of equal capacity.
- Doesn't depend upon slope for its location.
- Can be adapted to a feeding system the same as any other farm building.

Start With Engineered Plan

Since the bunker silo can be adapted to a feeding system like other farm buildings, its construction and location need to be *planned.* With proper location and construction, you can reduce freezing problems in the winter, reduce spoilage, and make it handy for self-feeding or for removing the silage with a tractor-mounted scoop or mechanical unloader.

Here's how to build a good bunker. A paved floor is a must—but the side walls can be of either *treated* lumber or concrete. Some farmers pour concrete walls in place. Many consider preformed concrete slabs tilted into place and supported by an earth bank or concrete pilasters to be the simplest method of construction.

Let the silo join a concrete feeding floor, particularly for self-feeding. Otherwise the silo should be *close to the feedlot* and have an *all-weather approach.*

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Orient the silo north and south if possible and use silage from the south end—which gets maximum sunlight. Morning and afternoon sun helps to minimize freezing along the sides. Best alternative is an east-west silo open on the east end.

Set a section of snow fence to keep heavy drifts from accumulating in the open part of the silo.

Follow recommendations for slope and drainage carefully. Poor drainage is a serious hazard, especially in self-feeding operations as manure may form a dam back of the feeding gate and force liquids into the silage.

Keep the silage as deep as possible to minimize the loss from surface spoilage if the silage is to be moved to the cattle.

Produce high-quality crops. The ensiling process is no magic formula for converting weeds into good feed. If it won't make good hay, it won't make good silage.

Harvest the crop at the right stage of maturity — and get it into the silo with the correct moisture content. For best results, a grass-legume silage should contain about 70 per cent moisture.

Forages containing too much moisture: do not ensile properly, they generate little heat, resulting in a "cold" silo subject to severe freezing, nutrients are lost through seepage, and the silage is not palatable.

Forages that are too dry: are difficult to pack and make high-temperature silages. Although the silage may be palatable, it may also mold in spots throughout the silo, it is low in nutrients, and it usually spoils quickly when exposed to the air.

Wilting of the forage may be necessary to get the right combination of moisture content and high nutritive value.

Test for moisture content with a moisture tester, by oven-drying a weighed sample of forage, or by squeezing a handful of chopped forage.

Forage that is too wet will stay in a tight ball when squeezed; it may even lose juice. Dry forage will fluff out as soon as released. A ball of forage containing the right amount of moisture will open slowly when released.

Some field guides for harvest time:

Alfalfa—one-tenth to one-fourth bloom.
Red Clover—one-half bloom.
Legume-grass—grass headed
Grass—early head to prebloom.
Corn—grain dented, sooner if the leaves begin to dry.

In filling the silo, self-unloading equipment that will spread forage evenly over the length of the silo usually does the best job. This permits even, thorough packing. Some farmers have

adapted large-capacity manure spreaders to the job.

It is difficult to spread forage that has been dumped in a pile. A crawler-type tractor equipped with a blade will spread the silage, but tends to ride the high points and may not do as good a job of packing as a wheeled tractor that exerts *point* pressure and follows the contours of the forage.

Keep plenty of forage along the edge to assure a good fill. *Pack one day after filling and get off the silo.*

Many kinds of covers have been used in attempts to reduce surface spoilage. None is completely effective without limitations. Materials such as earth, limestone, and sawdust are sometimes used. But they require extra labor during the busiest season, they may be difficult to remove, and they may have little effect on spoilage if they become dry and porous.

Low-value forages can form an effective seal *if high in moisture. Dry stubble* or mature clippings won't do any good.

Various synthetic covers hold a lot of promise. They can be made to seal the silo and virtually eliminate spoilage. But they are still difficult to hold on the silo.

Don't let animals or people on the silo after it has been filled. They will break the seal and increase spoilage.

Consider plans for feeding silage. You may be able to make some changes now to make the job easier next winter.

Keep the silage face even, regardless of how the silage is removed. Take off enough each day to keep the silage fresh. The amount depends upon time of year, but 2" to 4" is the usual requirement.

In self-feeding operations, figure on 3 to 4 feeder cattle per foot of width of the silo, depending upon the size of the animals being fed.

Two or 3 dairy cows per foot of width are usually about right.

Dwarf Fruit Trees Make Fences

Most important advantage of dwarf fruit trees is the small space they require, fruit crop specialists say. This permits more trees of different varieties to be grown and results in a continuous supply of fresh fruit during the growing season.

Dwarf fruit trees can be used as ornamentals in landscaping. They are particularly useful as fences. The trunks make the posts, and the branches make the boards or wires. The result is a good-looking rail fence that bears fresh fruit.

—*Illinois Extension*

The Hot Weather Problem and Fall Farrowing

Comfortable sows and gilts have bigger, healthier litters . . .

Condensed from Prairie Farmer

COMFORT and feeding are big items for sows and gilts in fall farrowing. With most of fall farrowings taking place in July and August, the summer heat creates a problem.

Housing is not usually much of a problem as litters are often farrowed in the open on a pasture set-up. However, shade, wallows or sprinklers, and a good water supply are necessary.

Research indicates that sows and gilts having access to a wallow or mist spray with shade during their gestation have larger litters.

For bred sows or gilts on good alfalfa or ladino clover pasture, leave out supplement and feed 3 or 4 ears of corn a day per head with minerals free choice, says G. Richard Carlisle, University of Illinois livestock specialist.

Cornfields Gleaned

During the fall months, the grain fed during gestation may be replaced almost completely by grain gleaned from cornfields.

On a drylot system, if you handfeed during gestation, give enough corn or oats to keep your sows gaining about a pound a day. Feed about 1.25 pounds of a drylot sow supplement to each sow daily.

For self-feeding your sows here are 2 suggested rations. If the sows seem to be getting too fat, reduce the corn and add more alfalfa. To get more gain, add corn and reduce the alfalfa.

Ration 1

300 lbs	ground shelled corn
300 lbs.	ground oats
300 lbs.	ground alfalfa hay or alfalfa meal
40 lbs.	soybean meal
40 lbs.	meat scraps or tankage
20 lbs.	mineral (2:2:1 mix of limestone, bonemeal, & trace-mineralized salt)
1000 lbs.	

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Ration 2

300 lbs. ground alfalfa hay
600 lbs. ground ear corn
100 lbs. soybean meal
100 lbs. meat scraps or tankage
20 lbs. mineral

1120 lbs.

Around farrowing time hand-fed sows should have their feed cut back by 1 to 2 pounds and then add a quart of bran to the ration. This can be done when you put them into the farrowing house.

With the self-feeding system at farrowing time, add ¼ bran to it and hand-feed the ration. Or you may mix and hand-feed the following ration from the time the sow goes into the farrowing pen until a week after farrowing:

300 lbs ground shelled corn
300 lbs. ground oats
300 lbs. wheat bran
100 lbs. drylot sow supplement

1000 lbs.

For a week after farrowing, the sow needs a bulky ration containing bran. By this time she should be getting a full feed of the bulky ration.

Then, increase the feed so that by the end of the second week, the sow is on a self-feeder containing grain and supplement. To feed a complete ration, mix your grain and supplement in the proportions of 1 part supplement and 3½ parts corn.

If the sows are to be moved to a pasture, the ration should be switched to 1 part supplement and 7 parts corn. For sows on good rye and legume pastures, grain may be reduced by 5 per cent and supplement by 25 per cent.

You will be making your final selections of gilts for breeding when they are weighing around 200 pounds.

A mature apple tree may have from 30,000 to 50,000 blossoms in a year. If only two or three per cent of the blossoms set fruit, the tree will produce a normal crop.

If You Hand-Feed

If you plan to hand-feed in a drylot, feed 1 pound of protein supplement and 4 or 5 pounds of grain a day. If you self-feed, use one of the brood-sow rations that are given.

For hand feeding on fair pasture, give them ½ pound of supplement and 4 pounds of grain. If you have good ladino-alfalfa pasture, omit the supplement, but provide mineral free-choice.

Brood sows on the farm of Viron Gustafson, Marshall county, Ill., can cool off in a creek bordered with small trees in the hog pasture.

However, the sows are removed from this pasture shortly before they farrow. Gustafson starts his

fall farrowing in July and continues it through September. The sows farrow under the sky on a ladino pasture. After she farrows an individual house is brought to her.

While on pasture, Gustafson gives the sows about an ear or two of corn each during gestation. The ration fed at farrowing time consists of around 1000 pounds of corn, 600 pounds of oats, and 400 pounds of 35-per cent protein ground and mixed together.

The farm population now comprises only 12 per cent of our population, compared with 65 per cent 100 years ago. But during the past seven years total rural population has increased by about four million.

The pigs when 7 weeks old are confined for a week. During this time they are weaned, vaccinated, and the boars that are not to be kept, are castrated.

The fall pigs are divided by size and sprayed with a benzene spray. During the summer this solution is put in the hog wallows to help control disease.

(Benzene is not recommended because of the danger of fire.)

Piperazine and hygromycin are both used to help control worms.

Shelled corn is stored in the same shed in which the pigs are confined. When the corn is consumed, the pigs have that area for additional housing.

The sows are put in the cornfield during the fall months. Gustafson gives them about 1 pound of supplement a head a day.

He feels the sows have stronger litters in the fall with the limited grain ration and also being on ladino pasture.

According to 1957 Farm Bureau Management records, return for each $100 worth of feed fed was $182. He plans on selling around 1500 head annually.

Warren Lough, Henry county, Ill., starts his fall farrowing around Aug. 10. Hogs are the only livestock he has on the farm.

Pigs are farrowed in individual houses on legume pasture.

Wets Down Floor

Around farrowing time Lough puts about one half bucket of water in each house. This is enough water to make the soil cool but not muddy. Also, concrete blocks are put under the north corners to provide for good circulation.

The pigs are vaccinated when then are weaned at 4 to 7 weeks old. They are kept on the pasture with a pig grower ration until they weigh around 100 pounds each. They are finished on a concrete lot.

Gilts are generally used for breeding purposes. However, Lough often keeps sows for fall farrowing. Spring gilts are put

on the cornfield to glean it. After gleaning the cornfield, they are given shelled corn free-choice with a pound of supplement. Alfalfa hay is also given the hogs.

The gilts are bred at 8 to 9 months of age. He usually keeps 3 boars for breeding purposes. During gestation, the ration consists of 2 pounds of oats, 1 pound of corn, and 1 pound of supplement.

Ten days before farrowing, Lough changes the ration to oats and a bulky feed such as bran. This ration is continued until 2 weeks after farrowing. Shelled corn and supplement is then fed to fatten them for the market.

Last year Lough produced 178,105 pounds of pork at an average cost of $10 a hundred, according to his Farm Bureau Farm Management records. This was about average for similar farms. The return for each $100 worth of feed was $175.

Egg Outlook in '58 Better

This year, 1958, will likely be more profitable for egg producers than 1957, according to F. Z. Beanblossom, Texas poultry marketing specialist.

On October 1, 1957, the number of potential layers was five per cent smaller than a year earlier. During the first half of 1958, this number probably continued below a year earlier, but in the last quarter, the size of the laying flock will be increased by the addition of pullets.

It seems reasonable to expect that the total number of chickens raised in the United States in 1958 will be from four to six per cent larger than in 1957, but there will be three or four per cent fewer layers on farms. However, increased production per bird will partly offset the decline in layers, and though egg output in the first six or eight months will be slightly below a year earlier, by late 1958, total production will be about equal or slightly above late 1957 levels.

With continued large consumer incomes and about a five per cent reduction in per capita egg supplies, prices to farmers in 1958 are likely to increase, says Beanblossom. The rise will be the most pronounced in the first eight months.

Silage for Meat and Milk in England

"We are only on the fringe of the possibilities that silage offers . . .

Condensed from Agriculture

Professor H. Ian Moore, Principal of Seale-Hayne Agricultural College

DURING the last ten years, grass — the most precious asset in farming today—has become the keystone of the feeding policy for cattle and sheep on the Seale-Hayne College Farm in England. In consequence, grass silage is the principal food during the winter months.

The place of silage as a feedingstuff in the economy of the farm depends on two vital considerations: it must be of high feeding value and, in comparison with alternative foodstuffs, it must show appreciable economies. Unless the silage is good the stock will refuse to eat it or will fare badly, and their performance will be unsatisfactory. This means loss of money and loss of potential. But however good the silage may be, so far as the feeding value goes, the crucial test is that of cost, for most of us farm for a living. Let us take this point first.

On the Seale-Hayne College Farm the comparative costs in 1957 were:

NOTE: First column is *Crop,* Second column is *Cost per ton of starch equivalent in shillings and pence.*

	s	d.
Grazing	11	0
Grass silage	17	2
Kale	16	9
Hay	29	7
Arable Silage	34	0
Dairy cake (at 35 Pounds per ton)	53	8

(The English Pound is now worth $2.80 in U.S. money; the shilling (S) 14c; the penny (d) a little more than 1c.)

It is well to remember that these costs (other than that for dairy cake) could be substantially reduced if the farm were purely commercial and not concerned with teaching and research. Nevertheless it is crystal clear that grass is the cheapest food for herbivorous animals and should therefore be exploited to

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the full. And not only is it the cheapest food; it is also the simplest to feed. Thus farmers should go all out to secure the longest possible grazing season. Modern aids and techniques, fertilizers and equipment, and new varieties and strains can be used. Though some parts of the country are favored with a longer grazing season than others, the winter feeding period is inevitable, and here the table shows grass silage and kale running neck and neck on the score of cheapness. Evidently kale is worth growing to extend the grazing season where conditions allow it to be grazed *in situ* and it can be relied upon to give a good yield, say 25 tons or more per acre.

Not all soils are suitable for the treading of stock in winter, although with modern cultivating equipment there is more scope today than there was twenty years ago to offset the effects of poaching. On some farms the problem of poaching has been overcome by taking two kale crops in succession. After the first there is ample time to repair any soil damage before sowing the second, and if this is consumed first in the season there is a reasonable chance of its being eaten while soil conditions are reasonably good for grazing. What is more, there is time left to sow a spring cereal if need be.

In the milder south and southwest, kale continues to grow and remain green and succulent into the new year, but this is not so evident in the north and east, where silage is likely to come into the rations much earlier. Quite apart from the question of poaching, there is the personal attitude to kale grazing. Many farmers hate to see their dairy cows consuming frosted kale or hock deep in mud or hunched up in pouring rain when they could be eating silage (at the same unit cost) in comfort. Moreover, on stony ground abrasions of the softened hoof are not uncommon. For my own part I believe there is much to be gained, even at some added expense, by giving the milking cow a little comfort.

Silage for Milk Makes Economic Sense

There is, therefore, a clear case on economic grounds for making silage. But, as I indicated earlier, it must be *good* silage. When grass is cut before flowering and properly ensiled under cover, there is a reasonable chance of getting a product with a crude protein content of 15 per cent or more and a dry matter content of 20 per cent or more. This silage can be regarded as a production food, and 16-20 lb. can be fed per gallon of milk *(Imperial or English gallon referred to in this article is approximately 20% greater than U.S. gallon)*

to replace 3½-4 lb. of concentrated food, thereby slashing the costs of winter feeding. If, however, the silage is not of this quality, because a much more mature crop or a wet one (which gives rise to the wrong kind of fermentation) was ensiled, or the silage was diluted with rainwater, more will be required to provide the necessary nutrients and the total bulk may then be too much for the animal.

The effect of rainfall is not generally appreciated. In many districts the winter rainfall may be of the order of 20 inches, and an uncovered silo 20 by 45 feet will take in over 9,000 gallons of water. I have often found the feeding value of dry silage from a roofed silo to be twice that of wet silage from an uncovered one, though both were filled with the same material. For the average cow, around 100 lb. of good silage should be adequate for maintenance and the production of 2 gallons of milk, and if all our cows were fed on silage to this level what a profound influence it would have on both the individual and the national balance sheet for milk production. All the signs are that from now on the simple laws of economics will force dairy farmers to set their sights on this target.

It is unlikely, however, that all the silage on a farm in any one year will be of such high quality, for this involves providing the requisite sequence of grass growth and having men and machines to deal with the grass at the critical stage of growth and in the least possible time. Most of us produce some silage each year which, by reason of being more mature when cut, is better for feeding to dry or young stock, and the evidence seems to indicate that perhaps this medium quality silage is the right type to provide for the fattening animal.

As for the total amount to be produced, much depends on the acreage of the farm, the layout, whether or not kale will be used to supplement the grass, the number of followers carried, and so on. A reasonable target for dairy cows and fattening cattle is 100 lb. for a period of 112 days or 5 tons a head. We have fed South Devon cows 150 lb. per head per day throughout the winter and secured maintenance and 4 gallons of milk with no other foods, but this is exceptional and few farmers could provide so much silage for all their stock. Young stock will need amounts in proportion, and calves born during the winter months should be offered silage as early as possible.

Cheap and Simple When Cows Help Themselves

As with the fresh grass, so with silage: if the cows help them-

selves, this is the cheapest and simplest way of feeding them. So the College pioneered self-feeding and was one of the first farms in the country to have specially designed buildings erected for the purpose, using dehorned Guernseys. At the end of our third winter of self-feeding, we are quite convinced of the soundness of the system. Cows housed in the traditional manner require approximately 140 man-hours per cow per year. In the self-feeding yards the comparable figure is 80 hours per cow per year—a saving of 60 hours or around 10 pounds ($28.00) per cow. The cows have never been fitter; we have produced more muck, which will in due course result in higher fertility on the College Farm and, perhaps even more important, the cowmen are well satisfied with the system. By putting up self-feeding yards and a milking parlor combined, we have been able to site the buildings strategically in the center of the leys. This not only facilitates grazing and minimizes the amount of travel necessary twice a day with the dairy herd in summer, but it also allows the use of the buckrake as the principal gathering tool for the silage. Our figures show conclusively that for distances of up to 2/3 mile the buckrake gives the greatest output. Even for greater distances it is the cheapest and simplest means of gathering grass for silage.

Now what about the beef animal? Recently the College has acquired a herd of Devons, which will be maintained as a self-contained herd out of doors all the year round in the traditional manner; only grass, supplemented in winter by grass silage, will be available. Steers and heifers not needed for breeding will be fattened and will run with the herd. Thus we hope to secure figures relating to the cost of beef production on grass and grass silage. The work has only just started, and so, unfortunately, cannot be commented on at the moment.

A good windbreak of trees around the farm home can reduce winter fuel bills as much as 22% by diverting winds over and around the house.

For Beef Production Too

The work of Morrison and Stephenson in Northern Ireland and Dodsworth and Campbell in the north of Scotland has shown the potential of silage for beef production. Dodsworth secured daily liveweight gains of 2.50 lb. with Angus x Shorthorn and Galloway x Shorthorn cattle fed high quality silage to appetite. The dressing percentage was 60.29, and the average consumption of silage ranged from 61 to 100 lb. Morrison with beef Shorthorns

showed gains of 2.4 lb. per head per day on silage alone, the animals consuming an average of 114 lb. per day.

During recent years the much greater potential profit to be obtained from milk in contrast with beef production has tended to emphasize unduly the value of silage in the diet of the dairy cow. Now that beef is coming into its own and milk production is less attractive, the balance is likely to adjust itself, and I foresee much more research being carried out on silage to their fattening stock. A recent report from the West Riding of Yorkshire gives the figures for one farm where Hereford bullocks were self-fed on silage for eight weeks in 1958, receiving in addition hay, straw and some cereals. They consumed from 60 to 75 lb. silage and put on approximately 2 lb. live weight per day, were fit and in better condition than when roots were fed.

Morrison records an interesting feeding trial in 1956-57 when self-feeding was compared with trough-feeding of silage. The bullocks received silage only, and consumed from 100 to 120 lb. per head daily. It was excellent silage, with 15 per cent crude protein and 23 per cent dry matter. The self-fed group averaged 2.04 lb. liveweight gain per day, compared with 2.48 lb. for the trough-fed animals. Another important point was that the labor requirement was particularly low, and even the trough-fed cattle needed only twenty minutes additional time daily.

Artificial insemination of dairy cattle continues to set new records. More than 6 million dairy cows in the U. S. were bred artificially in 1957.

It is evident from these results that not only has good silage a high food value for fattening cattle, but when self-fed, offers even greater advantages. Some planning of the buildings and the technique for self-feeding will be necessary in each individual case, but the farmer has never lacked ingenuity.

Silage for Sheep

Silage also plays an important part in feeding our ewe flock, the ewes receiving 10-12 lb. per head per day from early December until spring grass is available in March. Frequently, of course, silage forms the sole food. It is fed in hay-racks, which give some protection from the rain—a most important point. It is also important with sheep, as it is with cattle, to clear away any uneaten silage before it moulds and is rejected. Even more important is to feed only the best silage to sheep — silage produced from

young grass of high quality, well fermented and above all of high dry matter content. Ewes so fed have kept a clean bill of health, lambed down easily and milked well. On the other hand, the results with fattening hogs have been variable, and a great deal more work is necessary in this field. There is no apparent reason why the practice should not be successful and, as with fattening cattle, now that more interest is likely to be taken, more experience will quickly be gained and a suitable technique perfected.

The purpose of this article has been to outline our own experience at Seale-Hayne and to summarize some of the outstanding results of others in making silage the kingpin of the winter ration for cattle and sheep. There is great scope; we are only on the fringe of the possibilities that silage offers, particularly with the exciting new equipment for silage-making coming on to the market, which is likely to make it more attractive than even as an economic feedingstuff. But if you have not made silage before, do seek help and advice. Work with your District Advisory Officer—he will enjoy helping you. Silage enthusiasts in your locality will be flattered if you seek their advice, and to visit a silage demonstration will not only be exhilarating; it could also be very profitable.

Horizontal Silos Popular

Mention silo and most people automatically think of an upright cylinder. But, silos of the horizontal type, such as trench and bunker, have become more and more prominent.

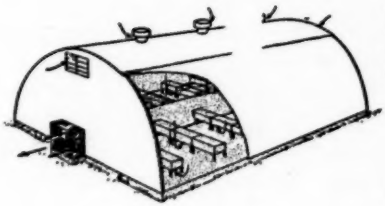
Lower initial cost and the possibilities of mechanized filling and feeding, or self-feeding of the silage, have been attracting many farmers to the idea of bunker or trench silos.

How good are these newer type silos? Guy S. Parsons, dairy specialist for the N. C. Agricultural Extension Service, says that the effectiveness of the various structures in preventing dry matter of grass silage depends on the farmer. He needs to be more careful in making silage in the horizontal type silo because of lack of weight from depth of silage as well as the greater surface area exposed.

These two disadvantages can be partially overcome by packing the silage with a tractor during the filling process and by covering the surface of the silage with plastic covers held in place with material such as sawdust, Parsons adds.

—North Carolina State College

Drying Grain in Storage



Whether you use heated or natural air, there is an installation to fit your operation and save your crop . . .

Condensed from
Electricity On The Farm

H. J. Barre, Agricultural Engineer

LAST year's (1957) corn and grain sorghum crops were believed to be the wettest on record. This was due to a late growing season with more than normal rains and with limited favorable weather to dry out the crops. As a result, much grain was lost by leaving it in the field or through spoilage in storage. Most of it was too wet to qualify for price support loans. Wet corn sold for 45 cents or even more below market price, depending on the moisture content.

However, farmers with drying equipment solved the problem of wet corn and milo. They were able to harvest it in time, avoid excessive field losses, and realize the maximum value of their crop at a very nominal expense for drying it to a moisture content safe for storage.

The condition last fall put both field shellers and drying equipment to a real test. Farmers were advised not to start shelling until the moisture in the grain was down to about 27% to avoid excessive cracking of the kernels. But even so late as the second week in November, corn in many sections was still above 30%. They waited no longer and began harvesting. They should and could have started much earlier when the weather was better for both harvesting and drying.

Now, we want to say something about one way of drying wet grains on farms, "drying-in-storage," which is yet fairly new. This is quite different from the heated air batch drier. Also, it should be distinguished from "aeration" which is nothing more than cooling with a very low rate of air flow. "Drying-in-storage" is simply drying the grain in a bin or building where it is to be stored. It can be done with unheated air in drier climates. With humid and cooler weather, supplemental heat can be used satisfactorily to heat the air a few

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degrees. Experiences last fall with this method are briefly described here.

Drying with Unheated Air

Many installations of both steel bins and buildings in Nebraska were used successfully in drying shelled corn and grain sorghum.

A typical building is reinforced for storing grain to a depth of about 10 feet. It is adapted for drying by installing an air supply duct 3 feet wide and 8 feet high, crosswise midway in the building. A perforated steel floor, supported on either 2x6's or steel supports, is placed over the regular floor to within 2 feet of the side and end walls. The required number of fans are placed at either or both ends of the air supply duct to force the air into the duct and from there under the floor and up through the grain. One 5 hp—24 inch fan is satisfactory for about 500 square feet of floor area. For example, a building 30 feet wide and 60 feet long, with a floor area of 1800 square feet, would require about four fans of this size.

Mr. Stander, a farmer at Central City, Nebraska, had firsthand experience last fall in drying shelled corn in a 30' x 60' steel building. He started to harvest with his combine on October 25 and finished on November 7, when he had a total of about 8000 bushels at a depth of about 6 feet. The moisture content of the corn ranged from 25 to 28%. He started the fans about the third day after he gegan harvesting at which time the depth of the grain was 3½ feet. From November 11 to December 12 he operated the fan only during the daytime, starting between 7 and 10 o'clock in the morning and shutting them off at 7 o'clock in the evening. At the end of this period, the corn in the bins tested 10.6% at the floor and 13.4% at the top. The fans ran a total of 603 hours with an electric bill of $200 or about 2½ cents per bushel.

Drying with Automatically Controlled Supplemental Heat

A good many steel in bin drying installations were used throughout the Corn Belt for drying high-moisture shelled corn. A typical bin drying installation used a supplemental heater controlled with a humidistat. The bin is provided with a perforated floor placed 16 to 20 inches above the concrete floor. The fan is installed in the bin wall and forces the air under the floor and up through the grain.

The bin is filled to a depth of 5 feet, after which drying is continued until the top layer begins to dry appreciably. This can be determined by simply walking on the grain. If one sinks in, then drying of the top layer of grain is taking place. Of course, a

much better method is to make moisture tests. When the top 6-inch layer is down to about 20%, another 4 feet of grain can be added. Even a third layer of about 3 feet can be added and dried.

In a two 21-foot diameter steel bin installation at the Walter Bevier Farm near Shelby, Ohio, harvesting was started November 11 and completed the day before Thanksgiving. The moisture content of the corn was about 35%. A 36-inch fan driven with a 5 hp motor was used to force the air through the grain. Two 200,000 Btu LP-gas heaters were used for supplemental heat. A total of 4000 bushels of corn was dried. The depth of the corn in each of the two bins was 7½ feet after drying was completed.

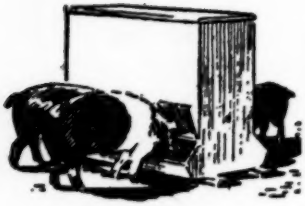
The fan was operated a total of 400 hours at an electric cost of one cent per bushel. The cost for 1000 gallons of LP-gas was $190, or 4.8 cents a bushel, making a total cost of 5.8 cents a bushel for both power and fuel.

The results with drying-in-storage installations with both bins and buildings just described have demonstrated this method of drying as being admirably suited for the farm, especially if the grain is to be stored as well as dried. A combination of bins or a size of building together with fans and heaters can be selected to meet almost any type and size of grain harvesting, conditioning and storage operation. When the grain is not more than 18% in moisture content, harvesting can proceed as rapidly as convenient. When it is higher, harvesting may be delayed somewhat because of the greater length of time required to dry. But ordinarily this delay is offset by interruptions such as rain, Sundays and holidays during which the drying continually goes on and catches up with the harvesting.

Reduce Gasoline Costs

Gasoline evaporation losses can be reduced by two-thirds if the storage tank is kept in the shade, a North Carolina agricultural engineer suggests. An evaporation loss of 15 per cent or more can occur in three months if the tank is kept in the sun, he says, but by proper shading, the loss can be reduced to about 6 per cent. Use an underground tank if possible. Do not store gasoline in farm buildings because of the fire hazard. An above-ground tank will reflect more heat if it is painted white or aluminum.

Raising Pigs in a Parlor



Confining your pigs from birth to market multiplies the importance of good management and equipment . . .

Condensed from The Furrow

Ralph Hughes

IT SEEMS only yesterday that the McLean County System was the latest word in swine production: Put them outside on clean pasture as soon as possible and keep the pigs there at least 4 months.

Then someone, somewhere, asked himself, "If the broiler people can intensify, why can't I confine my pigs and utilize my equipment and labor more efficiently?" The Confinement System was born.

Farmers in Iowa, Indiana, and Illinois—the three leading hog states—quickly turned to their agricultural colleges for the latest details on confinement. Last winter, Purdue, Iowa State, and the University of Illinois each held crowded meetings on the subject.

Swine specialists and engineers were called in. Farm pioneers of the system were put before microphones to describe their setups and experiences. One fact—words of caution—soon became apparent: When you confine pigs, you multiply the importance of management.

As Max Bailey said to the Iowa State group, "This is no way to get rich quickly. It's still a lot of hard work and takes the very best of management. I ran into plenty of problems." And Max started with a completely new setup and plenty of hog-raising savvy.

A man is rich in proportion to the number of things which he can afford to let alone.
—Henry David Thoreau.

"You don't have to go into the confinement system 'whole hog,' Purdue specialists repeatedly pointed out. Present buildings—either portable or permanent—can be used with a minimum of alteration and expense. The portable units permit more flexibility, but may sacrifice some

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labor efficiency. Many farms will find a good production system using a combination of both types of housing. It's wise to move slowly—feel your way 'til the 'shoe fits'."

Because of the increased efficiency of contract farming, only 60,000 integrated hog producers with 100 sows each, farrowing twice a year and raising an average of eight pigs a litter, could produce as many hogs as the 4½ million producers are raising for slaughter today.

Sanitation — the backbone of the McLean County System — is doubly important with confinement. When pigs are raised shoulder to shoulder behind closed doors, diseases seldom heard of before play havoc if sanitation barriers sag—so do old standbys, dysentery, rhinitis, etc.

Cleanliness cannot be overemphasized. This means a clean pen, clean sow, clean water, and clean equipment. Is all this cleanliness hard to come by? Purdue specialists say about an hour per sow prior to farrowing is all it generally takes to get your pigs started on the short, thrifty way to market.

Most confinement systems are organized around the life span of a pig from birth to market and divided into three periods: farrowing, growing, and finishing. We might add breeding and gestation, but these apply only to the sow.

Here's the new method:

Up to 10 Pounds

Sows are placed into a farrowing house a few days prior to their time so they can adjust to new surroundings. There is no difference in number of pigs saved in pens or stalls with proper design and good management. Stalls save space, but cost more to build. Weaned pigs leave the nursery at 10 pounds.

10 to 50 Pounds

Pigs are then grouped in the growing building by weight and each group fed accordingly. This is the period of the pre-starter, starter and grower rations. It is during this period—from 10 to 50 pounds—that the best, therefore most costly, rations are needed. This is the most "nutritionally critical" period.

50 Pounds to Market

Now's the time to "pour the coal on." Pigs weighing 50, 100, and 200 pounds require progressively more feed per pound of gain, namely 2.9, 3.4, and 4.3 pounds, respectively. This period is often divided in two: from 50 to 125 pounds and 125 pounds to market and rations formulated accordingly.

During each period, the use of properly designed buildings and equipment is important. But, there is no *one* best type to use. For example, you can find many hog producers saving over eight pigs per sow with either pens or stalls, providing both are designed and used properly. This indicates that the type of farrowing arrangement is not the key to saving good litters. Of greater importance is the man and his management.

If there is a key to good swine management, it seems to be a keen observation, a desire for a job well done, and a regard for the welfare of the livestock. Good management is a never-ending task, but the results are rewarding.

Pony Parasite Problems Increase

Along with the increase in number of ponies during the past few years, internal parasite problems have also increased. Inadequate control measures to prevent internal parasites have caused the loss of many ponies. Parasites also increase expense to the owner by interfering with feed utilization.

Ponies may be infested with several kinds of internal parasites but, ordinarily, only two types cause serious difficulties. They are parascarids (or roundworms) and strongyles (or bloodworms). The adult worms live and produce eggs in the intestinal tract. The eggs pass out with the feces and, after a development period of one to three weeks, infect the same or other ponies.

Ponies under one year of age usually show most severe symptoms. Symptoms vary with the degree of infestation. They may start with slight stunting of growth and end in death. Among the most prominent symptoms are poor hair-coat, stunted growth, anemia, pot-bellied appearance, diarrhea, coughing, and frequent colic attacks.

These control measures are recommended:

1. Have a veterinarian treat ponies twice a year or when needed as determined by fecal examination. 2. Avoid overstocking pastures, and rotate pastures yearly. 3. Clean stables regularly, and do not spread manure on permanent pastures. 4. Prevent feed and water from becoming contaminated with manure.

—West Virginia University

How To Ease the Livestock Load

Power, gravity and a little planning can simplify your chores and save a lot of hard work.

Condensed from The Country Guide

J. A. Peck

DURING the past few years, farm mechanization has progressed at an unprecedented pace. However, mechanization for the production of livestock has not kept pace with that we now enjoy in the production of field crops.

Farm buildings are the processing plants where raw materials of feed, grain and hay are converted to meat, dairy and poultry products, but this conversion process is very inefficient compared to the mechanization of field work. Today, no farmer would consider planting, tending or harvesting crops by hand. Yet in the farmyard, we often handle materials just like grandfather did, content to go along with inefficient, time-consuming methods. The need for mechanization in the farmyard is obvious.

Consider first what it will cost. We may simply use some ideas for making our work easier, with no cost whatsoever, or we may build an automatic feed handling system which might cost $10,000.

For instance, it costs little to do such things as:

1. Move feed bunks closer to hay or grain. (The cattle can walk to the bunk easier than you can carry feed across the feedlot.)

2. Replace gates with cattle guards and avoid opening gates several times daily.

These ideas cost so little you can't afford not to use them.

When we turn to more expensive ideas we need to consider the next question. Can you afford it?

You'll want to consider first how many bushels or animals you handle. If you feed 500 steers a year, you can justify quite an elaborate system. You can't justify spending much money to care for five milk cows.

Second, you must consider how much help you have. If you can handle all the work

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with the labor you have available now, you are not interested in spending much money. If you don't have enough help, you can justify spending money to enable you to do more with your own time. If you sleep in later in the morning, figure what that extra sleep is costing you. What you do with the time saved through mechanization is important.

You can lower cost by buying some pieces of equipment jointly with your neighbors, or by hiring a custom operator to do jobs with machines you may not be able to buy right now, such as forage harvesting. By making one machine do several jobs and thus spreading its cost, like using a forage harvester for chopping hay, silage or straw, the capital cost for each job is reduced.

You have to make your investment in better equipment and buildings pay back the money you put into them plus some. If it simply pays off and no more, or simply makes life easier for you, you can't afford it.

Let's discuss the most important phase of livestock mechanization, or that phase which is most laborious, that of "materials handling." U.S.D.A. figures indicate that 220 tons of materials must be handled annually for every 10 head of cattle, either dairy or beef. This includes the handling of hay, grain, straw, silage, water and manure. Hay, grain and straw must first be brought from the field and placed in storage. This may involve more or less hand work, depending upon how well we make use of mechanical devices. Once in storage, we have to start all over again and take these materials out, a little at a time. If it is grain, we shovel it, grind it, mix it and maybe shovel it again two or three times before it is finally in the feed bunks and mangers. If it is hay or straw, we may have to fork it two or three times before it is in a position to be eaten or used for bedding.

After this is all done, we have to thing of getting rid of the waste products, and handling products such as milk.

Much of the ordinary equipment in use on most farms today can be easily adapted to solve many materials handling problems. In addition, there is specialized equipment to make toil easier and quicker in the farmyard. Considerable thought and planning is necessary to put them to efficient use. Where the herd size is large enough, the additional cost of mechanization will result in a reduction of operating costs through higher production. We must, however, use machinery efficiently or our operating costs may increase. Generally speaking, the larger live-

stock enterprise can support more complete mechanization. This does not mean, however, that the smaller operator should not consider any degree of mechanization.

Splinters can be removed from human flesh almost painlessly if an ice cube is pressed to the spot for 20 to 30 seconds before removing.

There is no standard set of equipment which will do for all or even most situations. Each one must be individually planned. There are four simple rules to keep in mind when we consider mechanizing for materials handling:

1. Move the material as little as possible or not at all; e.g. self-feed. Animals have much more time to feed themselves than we have to feed them.

2. Move as large an amount as practical at one time. Why use a hand fork when you can handle a dozen times that amount at once with a tractor mounted one?

3. Make it flow continually. A small, inexpensive electric motor can handle a lot of grain in a short time by auger or flight conveyor, and is much easier than using a shovel.

4. Condense it. Reduce the bulk and weight for easy handling; for example, baled hay.

Now let's take a closer look at these rules. First, move the material as little as possible. There's no handling at all if you leave bales in the field after the final cutting. Cattle rip the bales open themselves and waste can be burned or spread with a harrow. There's no manure handling problem either, and it's ideal where they can be fed on less productive soil.

Hay stored in self-feeders will allow the animals to feed themselves. A giant self-feeder with a capacity of 45 tons may be built with poles 30 feet high and snow fencing material. The poles are spaced at 10-foot intervals, in a circle, and the snow fencing is placed around the poles. Gates at the bottom are raised to let the animals feed themselves. Inside the self-feeder, a cone is placed on the ground to divert the hay to the circumference of the feeder.

On the other hand, why not put smaller self-feeders on wheels? Then move them to the barn for filling. It's easier than pitching it onto a wagon, and then forking or shoveling it into a stationary feed rack.

Grinding grains directly into self-feeders will reduce the number of times you handle feed after it is ground.

There is little or no handling necessary when silage is fed directly from a self-feeding trench silo.

In handling water, remember the same basic rule. Don't move it. Provide automatic watering by replacing windmills with electric motors or gasoline engines.

For the dairyman, glass pipelines will carry the milk from milking machines to the milk house, and on to the milk cooler.

With regard to moving larger amounts of materials, a dual-purpose manure spreader, which doubles as a forage wagon, will be advantageous. With three to four-ton capacity this means fewer trips to the field.

In considering ways and means of making flow continuous we should not forget the cheapest and simplest device of all, the gravity system. This means using an overhead hopper with a gate and spout at the bottom. It requires no power, except to elevate the material to start with, and will probably have more application than any other device we could name. A simple pipe may be used to move feed by gravity from an overhead bin to self-feeders.

Hay put up in pellets for storing and handling like grain may be just around the corner, but for now baling and chopping are the most practical ways to condence it.

We should not forget the possibility of a fork or bucket on the front end of a light tractor. For moving silage, roughage, concentrate or manure they will save no end of shoveling or forking.

Alfalfa management studies in Illinois have shown that a four-cut schedule produced 4.27 tons an acre compared with 5.27 tons an acre from a three-cut schedule.

These basic methods of materials handling will do farmwork more easily, more efficiently and more productively. Stand back and take a long look at *your* materials handling problems, always keeping these four principles in mind:

1. Don't move it.
2. Handle larger amounts.
3. Make the flow continuous.
4. Condense it.

Much equipment is on the market at the present time, which will enable us to facilitate materials handling. It can be adapted to the size of farm and the preference of the farmer. It is not perfect yet nor 100 per cent foolproof, but the same problem existed with tractors 10 to 20 years ago. However, the farmer has now accepted the tractor as an essential machine for field work.

Let's now consider livestock buildings. Only recently have farm buildings come to be regarded with the same importance.

Buildings such as beef cattle shelters, hog farrowing houses, poultry houses and dairy cattle barns can be functionally designed, taking into account automatic feeding and watering equipment, temperature and humidity controls.

Interior arrangements, such as farrowing pens, calving pens, resting and feeding arrangements have been worked out with most efficient use of the buildings from a cost and labor saving viewpoint.

Now, how and where do we start with our own particular farm? Look at the situation as to arrangement of buildings and equipment. Think about the problem as you do your chores; where you walk, what you carry, how much you lift, the time you spend. You'll see places where something has to be done.

Then make an overall plan aiming at the final system you want, keeping in mind the points we have discussed. The final step is to start working toward your goal.

Gives Guides for Figuring Needed Farm Income

Farmers should aim for a total gross income about double the net earnings they want to make, says D. F. Wilken, University of Illinois farm management specialist.

Gross income is considered the total value of crops and livestock sold less the cost of any purchased feed and livestock. Net earnings are what a farmer has left to pay interest, debts, and income taxes, and to use for savings and family living.

Wilken explained his views this way. If an average farmer on a 200-acre farm needs $6,000 to provide for his living, savings, income taxes, interest and debt payments, he should aim for a gross income of about $12,000 or $60 an acre.

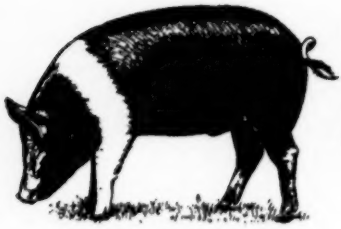
He pointed out that a 200-acre farm with about half the crop land in corn and the rest in oats and hay will average about $50 an acre.

If their farm doesn't seem likely to make the needed income, farmers have three choices. They can change their cropping plans, or add livestock to increase size of business, or improve their efficiency.

The farm management specialist pointed out that corn is the most profitable crop for Illinois farmers. From 1951-56, total income from corn averaged $77 an acre. Soybeans averaged $64 an acre, wheat $54, mixed hay $32, and oats $23.

—University of Illinois

Good Fall Hog Prices: Trouble in '59



The increase in spring pigs is now put at 2 per cent, 4 per cent less than early guesses; but June survey points to 14% more fall pigs . . .

Condensed from Wallace's Farmer

HERE'S what the June 20 pig crop report means to hog raisers.

Price prospects for the rest of this year are definitely better than forecast previously. The increase in our spring pig crop, estimated at 6 per cent until recently, is now figured to be only 2 per cent.

With more gilts likely to be held for breeding, this size increase is only about enough to take care of our population growth. Increased marketings will come early, August thru October, since practically all the boost was in winter pigs.

March and April farrowings actually were down 4 and 5 per cent from 1957. This will strengthen the November-December market.

The situation points to an early fall low, perhaps in October. It should be no lower, and probably will be higher than last fall's $16 low in early November.

Hog marketings are likely to spurt in February of 1959, however. If breeding intentions are carried out, we'll get a 13 per cent boost in fall farrowings.

If pigs saved per litter follow the normal upward trend, we'll get a 14 per cent bigger fall crop than we did last year. This means a fall crop of 41.5 million pigs, the largest since 1943.

One way to avoid losing your shirt it to keep your sleeves rolled up.

The trend toward bigger summer and winter farrowings is continuing. In the 10 major hog states, the intended increase in June-August farrowings is 18 per cent. And it's 13 per cent for September-November farrowings.

This trend is good for the whole swine industry. Smaller seasonal fluctuations in hogs going to market helps stabilize

Reprinted by permission from Wallace's Farmer, Des Moines 5, Iowa

prices, and it will help boost pork consumption.

The 14 per cent boost in fall pigs, if we get it, may push prices down 30 to 40 per cent next year. This means prices would average around $12 at interior markets in the February-June period.

Insects in the United States nullify the labor of at least 1,000,000 working men each year. Each pound of insects causes the loss of five pounds of vegetation.

The price response to changes in supply is much greater than it used to be, according to USDA. Before the war, a 10 per cent change in supply of hogs pushed prices 17 or 18 per cent the other way. Now it pushes them 25 to 30 per cent in the opposite direction.

Since next year's drop will be from the peak, it won't be disastrous. But don't forget the cyclical increase in hog production is just starting this year. It is pretty sure to continue thru 1959, and probably into 1960.

Huge corn supplies, a good crop outlook, plus good hog prices this year, are all behind the sharp increase in fall farrowings. But it's a sharper boost than the market will take without big price concessions.

There are some bright spots, however. The pork supply has been below average for some time. Pig crop forecasts have been running 2 to 4 per cent high recently. And there will be less beef going to market next year.

If pork producers will hold back a bit on farrowing increases, we can have another profitable year for hogs in 1959.

Here are the June 20 pig crop report figures:

The 1958 spring crop is now estimated at 52.7 million, compared with 51.8 in 1957, 53.2 in 1956, and a 1947-56 average of 54.6 million.

The indicated fall crop is 41.5 million, compared with 36.5 last year, 36.4 in 1956, and a 1947-56 average crop of 35.2 million pigs.

Pigs saved per litter this spring was 7.05, down from 7.12 in 1957. This is explained by our much higher percentage of winter pigs, and fewer March-April pigs.

Iowa's spring pig crop is just slightly bigger than the 1957 crop. Revised increases for surrounding states are: Minnesota, 6; Illinois, 3; Missouri, 4; Nebraska, 12; South Dakota, 17 per cent.

The survey indicates that Iowa will boost June-August farrowings 23 per cent. For September-November period, the boost is 16

per cent. This gives Iowa a 20 per cent increase in fall farrowings, versus 13 per cent for U. S.

The June-August boost for surrounding states is: Minnesota, 21; Illinois, 18; Missouri, 19; Nebraska, 34; South Dakota, 32 per cent.

Farrowing increases for September-November period are: Minnesota, 19; Illinois, 10; Missouri, 15; Nebraska, 17; South Dakota, 43 per cent.

Western cornbelt states are boosting fall farrowings the most — both percentage-wise and in actual numbers. Farmers in the seven west central states plan to farrow 415,000 more sows—a 21 per cent increase.

All the rest of the country put together plan to farrow only 283,000 more sows this fall than in 1957.

Crossbreeding for Fast-Growing Lambs

Sheep growers should consider using rams of the wool breeds (white-faced) with their black-faced native ewes, according to experiments by University of Wisconsin sheep specialists. This breeding scheme would allow a farmer to improve his foundation flock by keeping his best ewe lambs over the years, rather than purchasing a new group of western ewes every year.

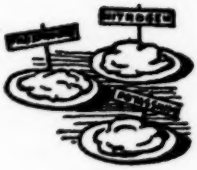
The aim in such breeding is to combine the long life, hardiness, and wool quality of the wool breeds with the early maturity, fast growth, and desirable carcass of the mutton breeds. When practiced over a number of years, it would be necessary to use wool and mutton rams in rotation.

During the last two years, the sheep specialists have compared lambs produced by the grade Shropshire flock when bred to Targhee and Shropshire rams. Targhee is a white-faced wool breed similar to Columbia and Corriedale. The lambs sired by Targhee rams gained faster and weighed more at weaning than lambs sired by Shropshires, the researchers report. Average daily gain from birth to four months was 0.45 pound for Shropshire-sired lambs, compared to 0.51 pound for Targhee-sired lambs.

Four-month old Shropshire lambs weighed about 62½ pounds while the crossbreds weighed about 70 pounds at that age. The crossbreds also seemed to produce heavier fleeces but there was little difference in staple length. Carcass measurements have not been analyzed yet.

The ewe flock was started from western white-faced ewes in 1936 and had been bred to Shropshire rams until 1954. Promising ewe lambs supplied the flock replacements.

Can Balanced Fertility Reduce Pests and Disease?



Recent soils research suggests that a more carefully balanced soil fertility may reduce plant losses.

Better Crops With Plant Food

William A. Albrecht, University of Missouri

SOME modern research suggests that more carefully balanced soil fertility may reduce plant pests and disease losses.

We can now set up demonstrations—some with and some without the accidental incidence of plant diseases and insects — to learn how the biochemical behaviors of the clay, the organic matter, and the inorganic elements of the soil serve to feed our crops.

Modern soil research suggests that the responsibility for disease and pest control, in many instances, should be placed with persons managing crops and their nutrition — and not with the chemist synthesizing more poisonous drugs to fight vermin and disease.

Nature grew most of our crops in healthy conditions before we took them over. When we found wild plants growing in excellent condition, or in what the ecologist calls "an ecological climax," *(a) they were in a pure stand, i.e. there were no contaminating weed crops, (b) they had been growing as the same crop in succession in the same location for many years, (c) they had accumulated much of their own residues as organic matter on and within the soil, and (d) they were free from diseases and pests.*

These facts present a distinct paradox when in an extensive reference work, published no later than 1954, there appears the following statement: "It would be impossible to over-emphasize the importance of crop rotations to control diseases, maintain fertility, prevent erosion, and maintain soil structure."

Such contradiction between nature without rotations, and man's claims for rotations in respect to plant health, suggests that much is yet to be learned by us about nature's success in

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growing crops with healthy survival and without chemical wars on diseases and pests.

When plants in nature reach their climax where no soil fertility (neither inorganic nor organic) is removed and when our agricultural management removes these far in excess of their return, might we not theorize that depleted soils and accompanying poor plant nutrition result in plant diseases and insect attacks?

Living conditions of Egyptian laborers (fellahin) are the poorest in the world—but they are said to cultivate the world's richest farming area.

On the converse, then, we might theorize that properly balanced fertility levels would prevent these troubles and yield healthier plants.

An affirmative answer was given in some delicately controlled studies of legume-plant nutrition. In tests with fungus diseases of soybeans, research clearly demonstrated that attacks were highest on soils with low calcium levels. These attacks were prevented by the higher levels of exchangeable calcium in the soil. This was the demonstration when all the soils were decidedly acid with a pH of 4.4.

Were this a case with no additional tests to expose soil fertility characters more clearly, we might have drawn the once common conclusion that the soils were all too acid to grow legumes. But as the sandy soils contained more of the same supply of acid clay and delivered more calcium to the legume plants, their growth varied from the miserable with severe fungus attacks to the excellent with no fungus.

This fact exhibited itself six times by six replications of the test.

Leaf-eating Insects

Recent research methods indicate the presence or absence of the leaf-eating insect (Heliothrips haemorrhoidalis) varied with the levels of nitrogen and exchangeable calcium. When the soil supplied ten milligram-equivalents, or less, of nitrogen per plant, the thrips made their attacks. When the soil offered twenty, there were no thrips. When nitrogen supplies were low but calcium was plentiful (increasing through 5, 10, 20, and 40 milligram-equivalents per plant) there were less thrips injuries as more calcium was available in the soil for plant nutrition.

These facts were demonstrated when plants were all in close proximity and the test design included ten replications to give ten repetitions of the demonstration.

Grain-eating Insects

In still more recent work, corn grown on soils with high fertil-

ity levels was better able to withstand grain borer attacks in storage than corn grown on poorer soils. Ears from plots fertilized with nitrogen only were small and became severely infested. Corn on an adjoining plot, given phosphorus fertilizer as well as nitrogen produced large ears without insect infestation.

This yield difference occurred *even when the soil test in advance of the soil treatments did not indicate any serious fertility shortages.*

"To Be Well-fed Is To Be Healthy"

Less pests and diseases resulted from balanced soil fertility in these observations:

(1) A legume crop growing its self-protection against fungus by the help of more calcium, the commonly deficient fertility element in humid soils, and the one regularly associated with plants producing more protein.

(2) A non-legume in which nitrogen helped the plant protect itself against an insect pest, but better so when that nitrogen was balanced with calcium and with possibly other untested elements which calcium mobilizes into the plant.

(3) The grain with its extensive destruction by a grain-eating pest when grown with nitrogen fertilizer only, but grain with an ingrown protection (resistance, immunity, antibiotics, or what have you?) against those insects when phosphorus combined with nitrogen was the added fertility growing the plants.

The 1957 production of broilers in the U. S. was approximately 1,400 million birds and the 1958 output may go higher. Since 1947, per capita consumption of broilers has jumped from about 4.3 pounds, ready-to-cook basis, to more than 18 pounds.

There is the forceful suggestion that not one element of fertility, but all of them *in balance and integration of their separate functions* are required to grow plants healthy enough to ward off these diseases and pests. There is the additional suggestion that any other element as the limiting factor, or in major deficiency, might show up under test as the "cure' 'or the preventive in similar tests or demonstrations.

Here the observations cited, first, the calcium, then nitrogen, then phosphorus in a readily anticipated order when we grant that calcium is the major nutrient in the soil.

Following in common order, the use of *potassium* would come next in line as help for the plant's growing its own protection. Then others would fall in line, too,

based on the way they become limiting elements in the plant's processes of growing whatever organic compounds through which it protects itself.

Such evidence indicates nature was able to produce crops without destruction from diseases and pests. It also suggests that while we may manage soils to give bigger crop yields, we have much to learn about soil management that nourishes plants well enough for them to protect themselves from diseases and pests without our poisons or medications.

It raises the question, also, of whether crops too deficient in their nutrition to grow their own antibiotics for self-defense would contain enough nutrients to produce healthful livestock.

Soil research faces a serious challenge to formulate balanced fertility as guarantee of less plant diseases and fewer crop pests, as well as a means of producing more vegetative bulk per acre.

Implanting Hormones Increases Lamb Gains

Implanting with stilbestrol or a combination of hormones increased gains of wether (male) lambs on pasture in recent University of Minnesota research.

R. M. Jordan, University livestock scientist, reports that lambs on rape pasture implanted either with 3 milligrams of stilbestrol or with synovex grew 28-31 per cent faster than did lambs not receiving the implant. Synovex is a material which contains 2½ milligrams of estradiol and 25 milligrams of progesterone, two hormones in each dose.

Daily gains of lambs on rape pasture averaged .4 pounds for those getting no implant, .55 for lambs implanted with stilbestrol and .57 for those implanted with synovex.

Jordan says the same comparison was made with wether lambs on alfalfa pasture. In this case, lambs implanted with stilbestrol gained .35 pounds per day, those on synovex gained .34 pounds daily and those receiving no implant gained .25 pounds per day.

Jordan emphasizes that implanting lambs with these materials is still an experimental procedure only; it hasn't been approved for general use by the U. S. Food and Drug Administration. Jordan also points out that past research at the University has shown there have often been unfavorable "side effects" in sheep implanted with hormones or hormone-like material.

—University Farm and Home News

What Is a 10-Gallon Cow?

"Testing intelligently employed cannot fail to make dairying more profitable and many times more interesting . . ."

Condensed from Western Dairy Journal

Margaret Bathum, Washington Dairy Owner

WHICH is the most valuable animal in your herd? If you are not testing, you do not know. A poor producer eats just as much and sometimes more than a good one. There is no way of determining the amount of butterfat which any given cow produces unless the owner has his herd on test. Guesswork is also involved on volume when milk is not weighed at regular intervals.

Certainly you know how much milk you are shipping, but do you know which cow is being "carried" by some other cow?

On our farm each cow's milk is weighed at every milking. (Pyrex jars hang from scales at each stall in our milking parlor.) And we cull low producers on the basis of this information. As a result our Holstein herd has several times averaged above 4%. Since milk in this area is paid for on a 4% basis, raising our herd's test has paid off.

This is only one way that testing can help in improving a herd. There are many others.

Testing is a must in a herd of purebreds, but it can be just as valuable with grades. It takes most of the guesswork out of breeding, feeding, culling and selling. No dairyman can afford guesswork in management. We have found that testing helps more than almost anything else to make an operation businesslike.

Know Bull's "History"

It doesn't matter whether a dairyman breeds artificially or

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keeps his own bull. If he is to breed herd replacements that are as good or better than his present cows, he must know the history of the bull that he uses. The history of a purebred bull is his pedigree plus the records of his milking daughters, if any.

Besides showing his bloodlines and his ancestor's type through classification, pedigrees are important because they show the production of milk and fat of the bull's female ancestors and the production of the daughters of his male ancestors.

A pedigree also shows the production of any milking daughters which the bull may have. If production records were not kept, any bull, no matter how handsome, would be a complete gamble.

In improving the production of his herd, experience shows that a dairy farmer should select the best bull he can find, remembering that 50% of a calf's inheritance comes from its dam.

Which are your best cows, the ones from which you want to raise your herd replacements?

Testing A Must

If you do not test, you are really only guessing. And no herd is improved by raising heifers from every cow in the herd indiscriminately, unless the herd is composed of equally topnotch cows—an unlikely if not an impossible state of affairs. Many farmers are not even sure of the quantity, let alone the fat content of the milk which each of their cows produce.

A sure sign that a dairyman tests is when he talks in terms of the pounds of milk a given cow produces instead of the gallons.

Calf scours or diarrhea is the most common ailment affecting young calves. Symptoms include dullness, gaunt-appearance, no appetite, rough haircoats and light colored feces.

Regular weighing of milk can be very useful in another way. Anyone who has worked with cows knows a sudden decline in the amount of milk produced can signal the onset of several illnesses. Sometimes this decline is noticed without weighing—too often it is not. Sick cows, like sick humans, stand a far better chance of a rapid recovery if their illness is detected and treated in an early stage.

We've found it is good management to feed each cow in a herd according to the amount of milk and fat which she produces. And it saves us money, too. Without weighing and testing this cannot be done.

Feeding each cow the same amount of grain can lose money in several ways. For one thing,

the good producer may not be getting enough so that she can produce to her full capacity.

Morrison's Bible

For another, more than one cow is sure to be getting more than she needs to produce to the maximum amount of which she is capable. Also the high tester should receive more grain than the low tester producing an equal amount of milk. Morrison's "Feed and Feeding," the Bible of dairy science on this subject points out this fact and allows more grain for the high tester in its charts on the amount of grain to feed an individual cow under varying conditions.

In order to keep a young cow growing as she should, more grain should also be calculated so that there will be sufficient to take care of her growing body as well as her milk production. A similar calculation must be made in feeding a bred cow in order that the calf which she is carrying will not be too much of a drain upon her bodily reserves.

In all these calculations, an exact knowledge of the production and test of the individual cow is imperative.

How then can a dairyman who is not testing know what each of his cows is netting him in a year? How can he cull his herd intelligently, how can he weed out the free boarders, improve his herd's production average and boost his net annual income?

Production Testing

Whether a farmer raises his own herd replacements or purchases them, production testing is invaluable. Most dairy farmers, whether their animals are grade or purebred, would prefer a herd which combines good type with high production. This is a praiseworthy ideal and type is most important, particularly where good udder attachments and conformation, body capacity, dairy character and strong feet and legs are concerned.

Everyone enjoys seeing a beautiful animal with a good straight backline and a long level rump. Let us face it though. An animal can be near perfection on all points and still be a poor producer.

How is an animal judged by a buyer when he purchases her from an untested herd? Many times she is purchased on looks alone. Sometimes the herd owner assures the prospective purchaser that she is a "10-gallon cow." It is barely possible that she was a 10-gallon cow a month or so after freshening, but it is a certainty that she was not throughout her lactation.

Was she a flash in the pan? Did she produce prodigiously for two or three months and then

fall on her face? We have all had cows like that. If we tested them we often found that they did not make 400 lb. of fat in a lactation — they were not persistent milkers. An animal who does not start out with a bang but who holds up steadily till drying time usually out-does the animal who produces heavily at the start and goes down to nothing abruptly.

What then is a "10-gallon cow?" It is an interesting question. What farmer can afford to purchase an animal on such vague generalities? If he buys from a tested herd he can see the records for each month of a full lactation—on the animal herself and in many cases on her dam and granddam.

Production Records

It follows, of course, that when we have surplus animals of our own to sell, they will attract more purchasers and command higher prices if they have unbiased production records—either their own and/or those of their ancestors. This is vital and indispensable in a purebred herd but it is also very important in a grade herd.

So it can be seen clearly and with very little argument that production testing more than pays for itself. It is an essential ingredient of breeding, feeding, culling, buying and selling — as well as account keeping on any dairy farm, big or small. It is more than this, too. It can be a source of great pride to any dairyman—using testing as a tool —to see his annual herd average increase from year to year and to see the outstanding individual records which some of his cows are bound to make.

I think that a farm where testing is intelligently employed cannot fail to be much more profitable and many times more interesting.

Stilbestrol of Little Value to Dairy Cows

Improvements in rate of gain and efficiency in feed-use resulting from feeding trace amounts of stilbestrol to beef cattle have caused dairymen to wonder what would happen if the hormone were fed to dairy cattle. Scientists at the U. S. Department of Agriculture have made tests. They fed a group of 12 cows a trace amount of stilbestrol for 60 days. There was no detectable effect on milk production when 10 to 15 milligrams of stilbestrol were fed daily for 60 days. *VPI Extension*

Birth of a Lamb

An English shepherd describes the right ways to deliver the ewe in difficulty . . .

Condensed from Farmer and Stock-Breeder
H. G. Clarke

NORMALLY, after the ewe which is about to lamb has moved away to a quiet corner of the field, and has passed through the usual periods of straining for anything up to an hour or more, the water bag begins to appear. Eventually the lamb's two forefeet appear together with the nose. After more straining the head and fore legs are presented. This usually bursts the water bag, if indeed the ewe has not burst it herself in her restlessness during her period of straining. Within a few minutes of the head and forelegs appearing, the lamb should be born.

This is the normal birth. On the other hand, the lamb may be born hindfeet first. Although this is unusual there is no difficulty in it. Indeed, I often think that it is the easier way for the ewe, because the thinner end of the lamb is delivered first, which tends to open up the passage for the shoulders and head.

As long as a ewe is lambing normally and is therefore making steady progress, leave her alone. It is only when she ceases to labor or when prolonged labor produces no results, that manual investigation becomes necessary.

The shepherd must first cleanse his hands as well as he can by scrubbing them in hot, soapy water to which a little disinfectant has been added and by trimming back and cleaning under his nails.

My own practice was to wash at home where hot water was available; and as I shepherded alone, I carried a haversack containing various lambing-time necessities, which included for the actual lambing a square of plastic on which to kneel and a bottle of antiseptic lambing oil.

Lambing Oil

After catching the ewe needing attention and lowering her to the ground, then liberally smear the hands, under the nails and over the forearm with lambing oil. The oil, apart from its antiseptic qualities, makes the insertion of the hand easier for the

Reprinted by permission from Farmer and Stock-Breeder, Dorset House, London S. E. 1, England

ewe and helps to soften the shepherd's hands.

The trouble may be that a ewe is vainly trying to produce a large single lamb, which is obviously being properly presented, with two feet and the nose clearly seen. All that is needed is a little assistance, drawing on the fore legs outwards and downwards each time the ewe strains.

As the ewe is having difficulty in producing her large lamb, it is obvious that its birth will cause her some pain, and the shepherd must apply his help with care and be content with slow progress.

Another case is where the head is completely visible yet no legs are to be seen.

Legs Turned

It sometimes occurs that the legs are only turned back at the knee joint. Here it is usually quite simple to draw out one leg at a time, when lambing can proceed normally.

Where, however, the legs are turned completely backwards it may be possible to slide the right hand into the passage and over the lamb and to draw the legs forward one at a time by slipping the fingers down over the shoulders. If this is not possible, then all that remains is first to dress the lamb's head with lambing oil and then ease it back far enough to enable the shepherd to draw the legs forward.

A rather more complicated case is where two lambs are in the passage together and, of course, cannot be delivered at the same time. There may be the head of one lamb and the legs of another, which at first touch give the impression that they all belong to the same lamb.

Where there are two lambs and the legs are hind legs, then the head must be put back so that one lamb can be delivered backwards. If the legs are forelegs, then both lambs must be put back and a new start made.

Another fairly frequent form of malpresentation is the lamb with its head turned backwards. Very often this means a dead lamb, but, whether it is dead or alive, by far the best way is to return it to the womb, then turn the lamb around and present it backwards. Thus the head is no problem at all. Of course entering the womb carries risks of infection, but with properly cleansed hands well anointed with lambing oil this risk is small.

Back End First

The only other case I shall mention is where the ewe has given up straining and investigation reveals that the lamb's back or breech, instead of the nose and fore legs, can be felt at the end of the passage and manual

aid is needed. If only a small part of the lamb can be handled the beginner may be in doubt as to which part of the lamb he can feel, or in which direction the head is lying.

This doubt can be overcome with the aid of a helper, who holds the ewe as well as a lamb already born within reach of the shepherd. The shepherd then has both hands free, and holds as much of the unborn lamb as possible in one hand and at the same time handles the other lamb to find the corresponding part. He then needs only to move the unborn lamb the minimum necessary to grip its hind legs and deliver it backwards. The experienced man will not need this aid, but it avoids much mishandling, through trial and error, by the beginner.

The young shepherd would be well advised in this case to settle down and to do the job as I have described, rather than to push and pull a lamb around its mother's womb indiscriminately, and end by pulling on whichever legs he happens to find first. This can cause further complications because if the lamb is dead and he pulls on the fore legs, then the head may turn backwards and he would have to start all over again.

Sensitive Touch

Every tremor or strain from the ewe will be passed to him through his hand, and this reliable form of communication must be his guide. He will find that the sensitiveness of his hand and so its power of communication will increase with experience.

Two crops of rice in one year—a main crop followed by a crop produced from the stubble—show much promise in tests at the Rice-Pasture Experiment Station near Beaumont, Texas.

This direct touch with the animal itself will invariably serve him better than a collection of insensible gadgets. Mercifully, the hook, the finger knives, the shortened pocket knives, lengths of wire and so on have almost passed into history. These tools are not for the novice, and I find it difficult to conceive an occasion when the expert will need them.

I have never failed to deliver a "normal" lamb—and with only my right hand. I refer to a "normal" lamb as my only failure was with a large freak lamb which, among other things, had six hind legs and could never have been normally delivered with any instrument. This sort of case demands the services of a veterinary surgeon if unnecessary suffering to the ewe is to be avoided.

How to Hold "Quick-Blow" Soil

These five practices add up to a good job at Kansas' Sandyland Experiment Field . . .

Condensed from Kansas Farmer

Dick Mann

STUBBLE mulch tillage, by itself, is not enough to pin down "quick to blow" sandy soil such as is found in much of the Arkansas river valley. That's what they are finding out at Sandyland Experiment Field, near St. John, Kansas, in Stafford county.

"Five practices are needed to do the job right," says Marvin Lundquist, superintendent of the experiment field. They are:

1. Stubble mulching.
2. Strip cropping.
3. Shelter belts.
4. A good fertilizer program.
5. A sound crop rotation program for the strips.

We interviewed Mr. Lundquist about these 5 practices. The following questions, with his answers, may help you in meeting similar problems on your farm.

What is stubble mulch farming?

True stubble mulching calls for keeping some kind of cover, either growing crops or crop residue, on top the soil at all times.

Are stubble mulch and crop residue management the same thing?

No. Residue management is planning for cover only during critical periods during the year. In Stafford county, for instance, there are 128,000 acres being farmed under residue management and only 8,500 under complete stubble mulch.

Why should a farmer using residue management change to stubble mulch?

Critical periods for crops do not always occur at the same time each year. With stubble mulch you don't gamble on having cover at the right time because you have it all the time.

Are there any disadvantages to stubble mulch farming?

Yes. Weeds are harder to kill and it is more difficult to kill

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volunteer crops in wet years. In some areas there may be difficulty in using conventional seeding equipment if crop residues are heavy. We have not had trouble here as residues have been light the last few years.

What about emergency measures for controlling wind erosion?

They are mighty questionable. They never completely stop the blowing and usually are done after some damage already has occurred.

Why is strip cropping important?

Strips break up a field, of course, so there is growing cover somewhere on the field at all times. They also permit using legumes in the rotation. It isn't practical for most farmers to put an entire field into a legume in this area but it is practical to put one or more strips into a legume.

How wide should strips be?

Eight to 10 rods seem to be about right.

Are practice payments available for strip cropping?

Yes, in some counties. Check with your ASC office.

Why do we need shelter belts in addition to these other practices?

Trees are the only thing that really slow down the wind. We need shelter belts to give our other practices a better chance to work.

How close should shelter belts be planted?

I don't know that any research has been done on it but I would say every half mile.

How do you find a good fertilizer program for sandy land in this area?

Every field should be soil tested before fertilized. Here at the experimental field wheat has shown a need for 40 or more pounds of nitrogen per acre. Some plots show good response to addition of phosphorus and potash. All three should be used, if needed, to help wheat get a quick start.

Grain sorghums here have been responding well to 30 to 40 pounds of nitrogen per acre. But, average grain sorghum yields have been raised from 26.8 bushels on check plot to 52.9 bushels with addition of a 40-40-40 fertilizer application.

On oats last year 40 pounds of nitrogen an acre boosted yield from 13.6 bushels in the check plot to 28.8 bushels. A 40-50-0 application raised yield to 35 bushels. Over a 3-year period an application of 25-50-0 increased yields from 9.3 bushels in check plot to 14.3 bushels. Average yield was 15.3 bushels with an application of 50-0-0. Phosphorus doesn't seem to increase yield on oats but helps get plants started in fall.

Is it true that where you use stubble mulch tillage you need more nitrogen?

St. John seems to be on the border line. Further east more nitrogen is needed; further west, no.

What is a sound crop rotation for strips on sandy soil?

More research is needed on this. At this field the rotation being used is 2 years of grain sorghum, 2 years of wheat and 1 year of sweet clover. Sweet clover is seeded in wheat stubble residue about April 1, and allowed to grow unmolested first year. It then is undercut the next spring in May and left on top of the ground as a mulch. A Skew Treader is used behind the undercutting blade to pull roots of plants loose from soil to prevent regrowth. Some alfalfa is being used in strips and experiments are starting on use of vetch and cowpeas. There is an inoculation problem with sweet clover in the St. John area that is not completely solved but good stands have been obtained the last 2 years.

Are there other points in crop and residue management that need mentioning?

Yes. Always remember that standing stubble of any crop is more effective against wind erosion than the same stubble left flat on top the ground. Under stubble mulch farming cut your field operations to a minimum. Everytime you go over a field it reduces effectiveness of the residue. Grain sorghum stubble in 20-inch rows provides more total residue cover than when crop is planted in 40-inch rows. At the St. John field, however, an experiment will be made with 30-inch rows. We will compromise on maximum cover in order to allow cultivation between the rows for better weed control. Crop rotation is needed on the strips in a strip cropping program partly to cut down your weed problems.

Poor Patient

Why is it necessary to shoot a horse when it breaks a leg?

Because a horse is such a poor patient. He won't be immobilized, and he'll smash a cast or fight a sling and will not be calm enough for the broken leg to heal.

A dog with a broken leg will have enough sense to hold it up, but a horse will put his entire weight on it, and it is impossible to treat it. —*From the English Digest*

The Contract Egg and You

Egg "integrators" push new methods and expect tastier, cheaper eating. The small producer is in trouble . . .

Condensed from
Wall Street Journal

Fred Stannard, Jr.

THE 5,300 cackling hens on the Bob Hendrix farm near Summerville, Georgia produce some 1.2 million eggs a year and an income of about $7,300 for the slim, sandy-haired chicken farmer. Yet Mr. Hendrix, youngish-looking for 41, doesn't own a single chicken, doesn't pay a feed bill and doesn't give a whit about the price of eggs or a market for them.

How does he do it? Quite simply. Farmer Hendrix is an early member of a fast-growing group of American livestock and poultry tenders who are trading their traditional economic independence for the less risky business of contract farming.

This rather formal term refers to a system of hen-to-you production that could mean cheaper eggs for the family food basket, and almost assuredly tastier eating for egg lovers. But aside from these fairly prosaic measures of commercial progress, this new way of doing things provides some interesting concepts in business farming that could have broad impact on the nation's rural economy and on folks who do business with farmers.

The Egg and You

Here's how it works: Farmer Hendrix has a pact with Tennessee Egg Co. in nearby Chattanooga, Tenn. Under this agreement he agrees to house and care for hens owned by the company, and collect and clean their eggs. In return, Tennessee Egg sees to it that Bob Hendrix' hen houses are always full of producing chickens, pays for feed and medicines, and supplies expert advice. For each dozen eggs produced,

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Mr. Hendrix receives 6 cents, plus a bonus, ranging from one cent to six cents a dozen, depending on an elaborate set of incentive performance tests.

Tennessee Egg takes the egg output from Mr. Hendrix, and 34 other farmers hereabouts who care for the company's 170,000 laying hens, and sells the eggs to l a r g e consumers — restaurants, grocery chains, bakeries. It thereby reaps the monetary benefits of mass production, mass feed buying, controlled feeding and volume selling—and more than makes up for the initial financial outlay.

"The production of eggs and poultry meat is becoming a business rather than a product of old-time farming," sums up portly, cigar-puffing Harry C. Carbaugh, president of Tennessee Egg. "They have specialists in industry. Well, we're developing specialists in the many steps it takes to get eggs and poultry from farm to market."

Clucking and Squawking

This trend is bringing squawks of disapproval from some folks in the egg business—but a lot of happy clucking from individual farmers.

"When I was growing tomatoes, beans and other vegetables," says short, ruddy-faced William Coley, "I made just about enough to pay the grocery bills. But now, I'm making two or three times as much and I'm well satisfied." Contract Farmer Coley earned $8,000 last year for tending 5,300 layers on his place at nearby Dalton, Ga.

Boasts Farmer Hendrix: "I don't owe anybody anything, and I wouldn't be able to say that if it weren't for contract farming." In the four years he's been caring for somebody else's hens, Mr. Hendrix has paid off his farm mortgage, put up two big hen houses and bought a new car.

Or hark to Mrs. William Mitchell as she stands on the porch of her white frame farmhouse near here: "We don't have any special skills, but my husband's a smart man and I don't think we could be any better off than we are in the chicken business." She says they grossed $12,000 for the 14-month period they raised their last batch of contract egg-layers.

"Peonage?"

It's true, of course, that contract farming does strip away much of the individual farmer's independence, for most of the decisions on hen-tending are made by the absentee owners. Then, too, the farmers often are compelled to follow strictly prescribed ways of keeping their hen houses. All this, critics charge, reduces the farmers to "peonage" or to a "share-cropping" status.

"It's against every concept of democracy," maintains A. V. Schollard, egg department manager of Safeway Stores, Inc., a large grocery chain egg buyer. Safeway buys its egg supplies from 8,317 producers who actually own their birds. The company has turned down a deal proposed by a feed company to enter a contract farming arrangement for its eggs.

Interestingly, this innovation in egg making and selling is proving an irresistible lure for a lot of folks who almost never see an egg except sunny side up. Attracted by the prospects of tidy profits, bankers, feed men and other businessmen are turning up in the anomalous role of egg contractors.

A little over a year ago for instance, Horace Steele, senior vice president of the Deposit Guaranty Bank & Trust Co. of Jackson, Miss., teamed up with L. E. Burnett, a feed and hatchery man, to organize Better Eggs, Inc., a contracting outfit. They currently have some 100,000 birds leased out and are confidently planning to double the size of their flocks.

Tennessee Egg's Mr. Carbaugh says his firm's average profit last year amounted to $1.10 on each of the birds let out under contract to farmers. This does not take into account the cost of trucking feed to the farms or supervising the production, says Mr. Carbaugh.

Not all egg integration schemes have turned out so successfully. Hurst Foods, Inc., of Bonner Springs, Kan., General Mills and about 170 farmers started an integration operation in 1956 and 1957. The farmers were promised a price of two cents a dozen over the Kansas City market and a minimum of 37 cents a dozen for large Grade A eggs.

But egg prices fell and Hurst began to run behind on its payments to farmers. Last winter, it asked them to forgo the minimum guarantee. In return, Hurst gave each farmer debentures for the money owed and eight shares of its $50 par common stock. But William Hurst, president, says he isn't discouraged by the set-back. "We've 125 producers now and all our payments are current," he adds.

Egg contracting is based on a simple truth: An egg is primarily feed and water; the hen is a necessary machine of manufacture. Provide a farmer with the means of production, and eggs will be forthcoming. By close supervision and control, you raise the quality of the product and vary the quantity.

Integrated production, of course, long has been common in industry, most notably perhaps in the steel business where big cor-

porations control each step from digging of the ore to selling the finished product. Even in agriculture, the idea is not entirely foreign; hogs, cattle and broilers have been raised under contract for some time. But it's only in the past couple of years that this technique has spread to the hen house, and the growth has been no less than startling—probably for the hens as well as the hen tenders.

New Hatchings

At this point, about one-fifth of the nation's 290 million laying hens strut around in "integrated" flocks of one sort or another, compared with practically none a few years ago.

Latest converts to the integrated egg ranks are Ralston Purina Co. and Armour & Co. Last week they disclosed plans to build and operate an egg processing and distributing plant in Georgia. Under the proposed arrangement, Ralston dealers would supply the hens to contract farmers, tote the produced eggs to Douglas Fresh Egg Co., which in turn would pass them on for retail distribution by Armour.

There are many, diverse types of egg contracting schemes but basically they all aim to remove some of the market perils of egg producing from the individual farmer. They range from Bob Hendrix' brand of contract farming to "specification buying" where the farmer owns his flocks but must follow certain farming practices dictated by the buyer of his eggs. In between are some of the big Western co-operatives such as the Poultry Producers of Central California and the Washington State Cooperative Farmers Association. These groups trade the farmer's promise to buy feed and supplies through them for a promise to buy all the farmer's output if he produces the eggs under specified conditions.

Feeding the Market

Many feed dealers have scrambled into the egg business more to assure themselves of a market for their wares than to produce and sell eggs. General Mills, Inc., for example, figures about 125 of its 500 Larro feed dealers in the South Central region now have agreements with their farm customers helping them to market their eggs.

Some contractors offer farmers variations on the theme. Foxbilt Feeds of Des Moines, for instance, "leases" day-old pullet chicks to farmers for 12 cents apiece (about one-fifth of the regular price). The farmer agrees to buy Foxbilt pre-mix feeds and at the end of the hens' useful laying life (around 18 months), Foxbilt gets a kickback from the sale of a specified number of hens as eating chickens.

Or consider the Better Eggs, Inc., routine. The farmer agrees

to put up new poultry houses to shelter 2,000 birds. The contract spells out the producer's housekeeping and daily duties. For this effort, he receives $150 the first month, and $200 each succeeding month during the useful life of the hens which Better Eggs figures is about 14 months.

The key to success of new integrated flocks, say their organizers, is close control of production. Each of the contractors therefore maintains a staff of poultry specialists who call on their contract farmers, usually about once a week.

Radio Dispatched

Sometimes this is a tightly-organized procedure. Southland Farms, Inc., of Hope, Ark., for example, equips the cars of its three supervisors with radios so they can be dispatched speedily to any of the 48 farms where Southland has spread its 120,000 birds. All of the 48 hen tenders, incidentally, are new to chicken farming, according to John Randolph, Southland's secretary-treasurer.

Poultry experts say close management of egg production can do much for the quality of the end product. Tested feeds, supervised feeding practices, clean nests, frequent egg collection, and controlled refrigeration all contribute to the quality of the egg.

What's the difference between a really good egg and an inferior one? The experts say the top quality egg has a round, stand-up yolk set in the middle of a firm egg-white. In contrast, the poor egg has a flat listless yolk that swims in a watery expanded egg-white.

For the higher quality egg that contractors say their close control assures, housewives may expect to pay less over the long run, they reckon. They point to prices of broilers to bulwark this prediction. Contract farming in that field has progressed so rapidly that last year 90% of the 1.4 billion broilers raised were under some form of contract farming. With the surge of contract farming, prices have fallen and sales have risen. In 1948, producers received an average of 36 cents a pound for the 371 million broilers marketed, nearly double the 19-cent-a-pound average price paid last year for the 1.3 billion broilers sold.

Squeeze on Small Farmer

This contracting business is accelerating a trend toward larger, concentrated flocks and, in the process, is shrinking the market for the smaller, independent farmer.

"It is next to impossible to produce high quality eggs unless the operation is policed or controlled all along the way," ex-

plains President Burnett of Better Eggs, "and it is not economically practical to supervise too many small flocks. Hence the trend to larger flocks of 2,000 or more."

Egg purchasers also have fostered the move to expanded flocks by doing most of their buying from the larger producers. This has done much to elbow the small, independent egg producer out of the picture.

"A small family could exist on the production of 1,500 hens back in the 1930's," says L. N. Thompson, general manager of Poultry Producers of Central California. "But if they don't have 3,000 to 5,000 hens today they're in trouble."

There are, to be sure, some large egg producers who continue to produce and sell their eggs independently. Take, for example, Harry Smith, whose 25,000 hens produce an average of 90,000 eggs weekly on his 30-acre farm on the outskirts of Salt Lake City. He buys his feed, has eight employes to care for the hens and clean the eggs, and sells the eggs to nearby supermarkets and grocery stores.

Remodel Crib for Shelled Corn Storage With Hardware Cloth

Hardware cloth may be used to form grain-tight walls in remodeling an ear corn crib to store shelled corn. Illinois farmers report that shelled corn stored in cribs remodeled with hardware cloth has kept well from harvest until the middle of the following summer.

Considering both labor and materials, hardware cloth is one of the most economical materials for making a crib wall grain tight. It is an effective way to rodent-proof the crib and has the advantage of keeping it available for further ear corn storage.

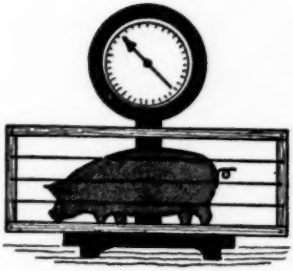
Hardware cloth will form a grain-tight wall if it is fitted between studs and pressed against the inside face of the cribbing. The strips should be one and a half to two inches wider than the space between studs so that each edge can be turned in and nailed.

Forming grain-tight walls is only one phase of remodeling an ear corn crib for shelled corn storage. Most cribs will also have to be strengthened to hold heavier loads.

For more information on crib remodeling, request Illinois Circular 775, "Remodeling Cribs for Shelled-Corn Storage," from University of Illinois College of Agriculture at Urbana, Illinois.

—Illinois Extension

How a Missouri Litter Set a New World Record



Litter of 20 Landrace weighed 1,222 pounds in 56 days and became the new World's Champion . . .

Condensed from Missouri Ruralist

Cordell Tindall

SCORE another triumph for education! A litter of Missouri pigs that set a new world record for weight at age of 56 days was farrowed in a schoolhouse!

Jesse Sisk, breeder of purebred Landrace hogs at Bethany, Missouri, bought an old country school on his farm, converted it into a farrowing house. Here was farrowed the record litter that consisted of 20 pigs (the sow farrowed 21).

A purebred breeder, Mr. Sisk is well trained in the science of swine production. He uses clean ground and good management practices. The litter of pigs is no accident. Of course, it was more than fortunate the sow farrowed so many pigs but was not totally unexpected; this is her third litter. She farrowed 49 pigs in the 3 litters, weaned 47 of them.

The record litter of pigs that weighed 1,222 pounds at 56 days old, got a quick start. The sow farrowed on Friday. When so many pigs appeared Mr. Sisk immediately got in touch with the county Extension office for someone to come out and certify the birth of the litter. Agents were on hand when the last of the litter arrived. County Agent Chas. Belshe was there for the official weighing at 56 days. He thinks, if anything, the pigs might have weighed a little more.

The sow and pigs immediately were moved to another house, more room was needed! The pigs first went on a 4-hour shift, then 10 on daytime shift, 10 at night. By Monday they were eating prestarter pellets. As you might guess the pigs got a little extra in the way of feed. A local feed dealer got interested, offered to

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supply the feed if the world's record could be broken! The goal was a litter weighing 1,000 pounds. The ration was an Iowa State College formula.

The sow did well nursing the pigs, too. She was doing so well that when the pigs were weaned 7 more pigs from another litter were put with her—so she could taper off, so to speak.

The pigs weighed 71 pounds at birth. The other 2 litters farrowed by this sow weighed 42 pounds (13 pigs) and 49 pounds (15). The sow farrowed these 3 litters in little more than a year.

The big litter got a pen and a house, too. Mr. Sisk has designed a big building with hinged doors at each end for shade in summer. Also can be used in winter.

The schoolhouse farrowing house has 10 stalls. This means 60 litters a year, full capacity. One farrowing period is being missed this year. Heat lamps are being used in the crates.

He is concentrating on good breeding of Landrace. He now has 2 sires that have been tested in swine evaluation stations, one in Illinois and one in Iowa. His "Topper" boar, tested in Illinois, gained 2.06 pounds a day on test, required 3.04 pounds of feed for a pound of gain and weighed 200 lbs. at 144 days old.

A "Balancer" boar tested in Iowa gained 1.88 pounds a day, had a feed conversion of 2.81, and back-fat thickness averaged 1.02 inches.

These Do Best

Mr. Sisk has found his thicker, deeper-bodied hogs are the ones that do best for him. He does not like "snakes" in the meat-type hog breeds.

Not only are farmers becoming a minority in total population, but they are also a minority in rural population, since more nonfarmers than farmers now live in the open country.

Evidence that he is breeding a type of hog popular with commercial producers is the fact last year he sold 233 boars for herd sires. He has the world's record litter of pigs now, and that should help sales even more! He plans to exhibit at Missouri State Fair and other shows in the Midwest.

One more impressive statistic on this hog-production program: he has been farrowing in the converted schoolhouse since 1955 and is shy 3 pigs of saving an average of 11 pigs to the litter. His average is 10.9 to the litter!

And one group of 4 pigs weighed 209 pounds each when 4 months and one day old.

No, this world's record litter was no accident!

Sorghum Won't Drown Out

Grain sorghum may be just the crop where bottomland floods. It thrives under water . . .

Condensed from Farm Journal

Dick Braun

WE'VE always known that sorghum could take a lot of drouth. Now it looks like it will take a lot of flooding, too.

Last spring, Indiana farmers along the rampaging White River were amazed to see grain sorghum alive and growing after being under water for five or six days!

Corn and soybeans alongside were dead as a dodo—completely drowned out.

The farmers called in Purdue University scientists who decided to see just how much water sorghum could take before it drowned.

"Two weeks under water actually seems to refresh sorghum plants," says scientist R. C. Pickett, who has been running greenhouse tests. "Some varieties can stay completely submerged for four weeks without any signs of damage."

Apparently the same waxy coat that helps hold water inside the leaves during drouth, also helps keep out water in a flood.

Sorghum's water resistance dropped when student researcher Neal Barnett scraped the waxy surface off submerged leaves. The plants still survived under water, but they were damaged more.

Each person in this country uses an average of more than 1500 pounds of food a year, says the U. S. Department of Agriculture.

Barnett has also kept sorghum standing in two inches of water for two months. The plants slowed down some, but they managed to produce heads and set seed.

The Purdue scientists are also finding that some varieties resist flooding better than others. They are stepping up tests to see which ones can take the longest dunking.

Meanwhile, Indiana farmers who saw last year's results are using sorghum as a hedge against floods this season.

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Bernard Roudebush, Greene County, Ind., watched 20 acres of Texas Hybrid 610 pull through last July's floods and make up to 108 bushels per acre early last fall. This spring, he put his lowest ground in sorghums.

Fertilizer prices increased only a small amount in the last 20 years, while the average cost of all other farm production items rose nearly 2½ times.

Sorghum, like corn, had some maturity problems last fall.

"But we got high moisture grain because much of it was planted late as an emergency crop," says Pickett. "In the central Corn Belt, plant grain sorghum before June 15."

Pickett has speeded up heading 7 to 10 days with 100 pounds of extra nitrogen, either put on at planting time, or side-dressed later.

This year, the Purdue scientists are going after really big yields of sorghum. They'll be shooting for 200-bushel yields, *and hope to hit 250 bushels within five years.* Last year, one plot made 191 bushels per acre.

Ten pounds of seed in *rows seven inches apart* jacked up yield averages 20% to 40%.

"Higher planting rates probably wouldn't work in dryer areas," says Pickett. "But we think that this closer spacing will make it fairly easy to hit 200 bushels per acre."

The Old Gray Mare's Comeback

The old gray mare is what she used to be once more—a working logger.

Old Dobbin, the draft horse, is back in the northwest woods again, pulling her load alongside the giant machines of an industrial forestry age. Up until a few years ago, the horse had been pretty much pushed aside by the modern gas burners — big diesels and specially equipped tractors. But the horse has been given a rebirth by the modern practice of tree farming.

The horse is proving that, in most cases, it can slip into thick stands of young trees and log out the thinnings faster and more economically than the big machines can. But the biggest factor in Dobbin's comeback is that he reduces to almost nothing the damage done to young trees in getting logs out of the woods.

—From Forestry Digest

Your Trouble Could Be Nematodes

They cause a billion dollars worth of crop damage. Here's information about five species that give the most trouble in the Midwest . . .

Condensed from Prairie Farmer

Keats Vining

FARMERS in the United States have been fighting disease and insect enemies as long as they have been farming. All this time there has been an unseen enemy in the soil they have scarcely been aware of. This is the lowly nematode.

Right now a lot of fuss and attention is being given to nematodes. And well there should be because this soil pest causes crop losses of at least a billion dollars a year.

Nematodes attack just about every plant that grows and everywhere on earth from the tropics to the artic regions.

Midwest farm crops affected are many. Among them are soybeans, sweet corn, strawberries, onions, tobacco, carrots, spinach, seedling trees, nursery stock, sugar beets, flowering bulbs, potatoes, melons, and even lawn grasses.

What are these nematodes?

They are tiny worm-like parasites that destroy by feeding on plant roots. They are microscopic in size. One nematologist compares them in size to a grain of salt.

Most Numerous Creatures

There are thousands of nematodes. Some authorities say they are the most numerous of all creatures on earth. A cubic foot can contain 6 million of them. Some nematodes are beneficial. Harmful ones are the plant parasites.

While they are microscopic in size, their work on plants is easy to see in the form of inferior, off-colored small nursery stock, deformed vegetables, dwarf cotton and tobacco plants, and withered sugar beets. Often the damage isn't noticed because there are not enough good plants for comparison.

Parasitic nematodes cause damage by burrowing into plant roots, piercing healthy cells with a syringe-like beak and sucking out the plant's vital juices. When this happens destructive fungi and bacteria may enter the root and cause further trouble.

Reprinted by permission from Prairie Farmer, 1230 Washington Blvd., Chicago 7, Illinois

The injured and diseased root cannot absorb needed plant foods from the soil. If the plant does not die, it never attains full growth, remains stunted, with resulting poor crop production.

Hold good storable corn for summer sales, suggests Michigan State farm economists. It will improve in quality and stand a chance of a little better price.

Jerry Mandigo, district fruit agent for south western Michigan, says nematodes cause a lot of trouble that growers credit to disease, insects, and a lack of soil fertility.

John Davidson of the agricultural development department of a Michigan chemical company reports that each year some additional disorder is found to be caused by the nematode.

Five Prey on Midwest

While there are thousands of different kinds of nematodes, the Midwest has about 12 that do some damage with 5 that do a great deal of damage. One is the root nematode that causes the formation of galls or swellings on roots. They shut off water circulation. These are easily seen on roots.

Do not mistake them for the nodules formed by nitrogen-fixing bacteria. The latter appear to be attached to the roots from the outside while nematode galls are formed by an enlargement of the root cells from the inside.

The meadow nematode does not cause root galls but attacks the fibrous roots causing a slumping of the roots and forming brown spots or lesions. The stunt nematode is one that just stunts plant growth. The root system from an infected plant appears healthy, except that the roots are shriveled and greatly reduced in size. All three of the above forms are found in tobacco fields.

The cyst-forming nematodes are hardest to control. Different species of cyst-forming nematodes attack soybeans, sugar beets, and potatoes.

Michigan onion fields are known to harbor at least four of these nematodes. Some Michigan celery fields have become so infested with nematodes that they have been abandoned as productive celery fields. Michigan cherry growers in planting new orchards found areas where the trees just didn't grow. After checking fertilizer and organic soil needs, they finally found it was nematode trouble.

Onion fields with bare spots, carrots with knotty and useless roots, rough-surfaced potatoes, stunted sugar beets with heavy useless roots, strawberry fields whose plants never seem to grow and have poor yields, yellow-looking areas of soybeans, in fact

any appearance of poor growth is an indication of possible nematode trouble.

Bluegrass in lawns and golf courses that turns brown in the summertime, in spite of water and fertilizer, could well be nematode trouble. Orchard sites that are used over and over, as is often the case with peaches, become heavily infested with nematodes causing losses of newly-planted trees.

Indiana peach growers have found that preplanting soil fumigation treatments will permit a shorter time interval between the removal of old orchards and planting new peach trees on the same site.

Soybean growers are on the anxious seat these days. The soybean cyst nematode is a new pest that attacks the roots of soybeans. How it came to this country no one knows, but it is found in six states, some of which are not too far from the main soybean growing areas in the Cornbelt. Soybeans affected become yellow, stunted, and low yielding. A severe infestation can kill a crop.

Check Your Soybeans

Dr. John Knierim, nematologist at Michigan State University, suggests that growers who have yellow spots in their soybean fields pull up some plants and look at the roots. Look for tiny cysts attached to roots. They are smaller than a pin head and can be either yellow or white. If you find this condition, send the plants to the entomology department of your state agricultural college.

Deep-rooted plants often build up a nematode population that is hard to control. Florida citrus growers are putting fumigants down 18 inches in the ground to control nematodes that affect their trees.

A nickel's worth of trace element, molybdenum, can increase legume yields in Eastern Washington up to 320 lbs. per acre, reports a Washington soils scientist.

The nematode problem has become so serious that land grant colleges and universities are employing trained nematologists to work on the problem. Get in touch with these men if you suspect you have nematode trouble.

Man is the worst offender in the spread of nematodes. Recently a Kent county, Mich., celery grower needed more plants to finish setting a field. He obtained some from a neighboring county that were infested with nematodes and they soon infected his farm. When the Mayflower II landed at New York, federal plant inspectors checked the ship. They found soil on potatoes used on the voyage that was full of golden nematode cysts.

The dirt that is cleaned off sugar beets at weighing stations or processing plants is generally put back on the trucks hauling beets and dumped at the first farm the truck stops at.

The man with a nematode problem is looking for a solution. Crop rotations have been an aid over the years. Nematodes don't like dry weather and are killed off or restricted in their activities when fields are summer fallowed.

The U. S. Department of Agriculture estimates that for every dollar a livestock owner spends for veterinary service he gets a return of $5.78.

Farmers should look for crop varieties that are resistant to nematodes. Blackhawk, Anderson, and Monroe soybeans are resistant. Some oats are resistant to some nematodes. Plant breeders are looking for and breeding other crops that could be resistant.

Cultural practices are being teamed up with another nematode-control practice, that of soil fumigation.

Greenhouse men, both flower and vegetable growers, have had nematode troubles for years. They found that soil sterilization with live steam controlled the nematodes and also killed other life in the soil. Barnyard manures were incorporated back into the soils to add soil life, but sooner or later the nematodes came back. Steam sterilization is only practical in the greenhouse.

Probably the most effective way of controlling the nematode other than cultural practices, is by the use of soil fumigants. These fumigants are liquids which when placed in the soil volatilize and spread through the soil as a vapor, killing the nematode.

Fumigation offers some problems. One is the cost of the fumigating material. Others are the right kind of an applicator to put the fumigant in the soil, soil conditions, proper time of application, and the effect on crops to be planted. Fumigants look like a practical way to give some control.

There are a number of effective soil fumigants on the market. Most of them are manufactured by chemical and oil companies. They have their trade names. With them are careful directions for their use.

The soil fumigant is applied by broadcasting or row application. Broadcasting doesn't refer to the top of the soil only. It is put down 8 to 10 inches in the soil and over the entire field. Row application is treating only the area in the row where a

plant or seed is to be planted.

To hold the fumigant in the soil the ground is smoothed over and compacted with a plank or other means. It is well to follow with a cultipacker, firming the ground and sealing the fumigant in the soil. The soil should be left undisturbed for 7 days.

Row Fumigation

The row applicator works much the same way but the fumigant only affects an area about 12 to 14 inches wide. The applicator in both cases has to be well made and accurately calibrated.

The time of application varies but it should be 2 to 4 weeks ahead of planting time. Wait long enough before application for any roots and turned down organic matter to decompose. Annual applications are generally necessary as reinfestation of fields frequently occurs.

Soil temperatures at time of application should be between 50 and 80 degrees. Soil moisture should be from 50 to 80 per cent of soil capacity. Sandy soils can be better fumigated than clay soils. Compacted soils hinder the spread of the fumigant. Soils should be worked deep and be well pulverized before treatment.

Fumigation by the broadcast method will cost from $30 to $50 an acre. Row fumigation is about half that cost.

The big question is: Does it pay to fumigate soils? The Hawley Nursery near Hart, Michigan, had trouble in raising their nursery stock, particularly cherry trees. They started fumigating in 1953 using dowfume w-85. They left check plots. The trees were dug, graded, and sold. The 12 gallons of fumigant used cost them from $85 to $90 per acre. The quality of the trees was such that the average return per acre of the trees grown on the fumigated land was $2000.

New York carrot growers just about went out of business due to nematode trouble. Soil fumigation increased their production 300 per cent.

Good Market for Forest Products

U.S. Department of Agriculture experts forecast a long-range increase in demand for timber. By 1975, they say, demand may increase by 25 to 40 per cent.

This estimate, according to the Forest Service, may prove to be too conservative if population increases are more than presently anticipated. In either event, demand for timber is expected to outrun supply within a few decades, particularly for preferred softwood species, such as Douglas fir, and for high-quality timber.

Soil Bank Changes Coming

Expected changes in the Conservation Reserve will boost acreage rates. If the whole farm is banked, low, non-diversion rates may be eliminated and a 10% bonus added . . .

Condensed from Nebraska Farmer

A $3-per-acre boost in soil bank payments is just one of the changes on tap for the conservation reserve portion of the soil bank program.

Robert Webb, Nebraska ASC administrative officer, points out that the average rate for conservation reserve payments in Nebraska has been tentatively set at $12 per acre for 1959. Up to now the average rate has been $9 per acre. But he emphasizes that the new rate has not yet been set for sure.

"It might even be higher," he says. "USDA has assigned Nebraska a goal of 625,000 acres to be retired in the conservation reserve in 1959. In the 3 years the program has been in operation—'56, '57 and '58—we've only signed up 148,000 acres.

So at present the whole thing is in the formative stage. We're trying to figure out what rate is needed to reach this 625,000-acre goal. But," he continues "the program should be set up by the first of August so that we can start sign-up by Sept. 1."

Similar changes in the Conservation Reserve part of the Soil Bank Program is planned for other states. National average rates are being raised from $10 to $13.50 per acre. Tentative Illinois and Iowa average rate is $19. Rates for top farms in some counties may go over $30 per acre . . . The Editor

Here are the changes Webb expects if the new conservation reserve program goes through as it has been tentatively set up: Average payment rate for his state as a whole will be $12 per acre. This will vary by counties, as before, with a low of $8 to $9 in the western part of the state to a high of $17 to $18 in the east where land values are higher and the land more productive.

In addition, rates will vary within a county, depending on the relative productivity of each

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individual farm. Formerly, conservation reserve payments could not exceed the county rate. Thus, payments were the same for both the best and worst land in the county.

Under the proposed program, payment can be either higher or lower than the average county rate. For instance, if the average county rate were $14 per acre, and the land to be put in the soil bank was 50% more productive than the county average, payment would be $21 per acre. If the land were 50% less productive, payment would only be $7 per acre.

Non-diversion rates will be increased, too. Presently, rates for acreage of non-diversion crops—such as tame hay or rotation pasture—are only 30% of the regular rate. This will be boosted to 50% under the new program.

Also, non-diversion rates will not apply if the whole farm is banked. Before, part of the farm had to be banked at the non-diversion rate. Now, the whole farm would go into the soil bank at the rate for cropland acres. In addition, a bonus payment of 10% will be made if the whole farm is put in the soil bank.

These changes—and new rates—will apply only to land banked in the conservation reserve in 1959, Webb says. Payments on land already in the reserve will remain at contract levels.

"As of now," Webb says, "it looks like the acreage reserve part of the soil bank is dead. Congress hasn't made any provision for funds for acreage reserve payments, so we have to assume that this part of the program won't be in effect in 1959."

Family Car is Expensive Item

Recent figures from the U.S.D.A. show that 87% of the farm operators in the United States own a car or truck used for family transportation, 74% own an automobile, and almost one in ten own more than one car.

Having an automobile represents a major item of expense. About one dollar out of every seven is used for transportation. Farm families in the $2,000 income bracket spend one dollar out of every eight for car or truck operation, and those in the $7,500 income group spend one dollar out of every six.

Among the car owners at every age level, expenses tended to increase with income. More money is spent for car operation and upkeep than for the purchase of new automobiles, the figures show.

—Virginia Extension

Ducks, Ducks, Ducks

Lee Cory, one of 10 duck raisers in Kosciusko County, Indiana, finds the sideline interesting and profitable . . .

Condensed from Indiana Farmer's Guide

Fred Myers

A FARM LOT containing 4,000 ducks is an unusual sight in Indiana.

Lee Cory, R. 1, Milford, one of about 10 duck producers in the northern end of Indiana's Kosciusko County, raises Mammoth Imperial Pekin ducks. He could get by without the small profit the ducks bring him, but he likes the unusual and interesting business. Besides, to Cory, duck raising is a challenge.

Cory started raising ducks in the depression days of 1932 when a dollar was mighty hard to get. He figured raising ducks would help to pull him through the economic squeeze. This is his 27th year as a duck producer and he still enjoys this specialty business. He is mostly a grain farmer.

But there have been problems concerned with facilities, feed handling, and production short cuts. He says, "There is really no one to turn to when you have a problem in this business because hardly anyone else is raising ducks. You make your own decisions."

There are three parts to the operation. The first begins in a 16-by-32 foot building where the young ducklings start their 7½-week long journey to the processor. Cory buys all his ducklings from the Wayne Duck Hatchery in Wayne, Ohio. They are kept in this building for two weeks.

Then they are moved to a second building, 30 by 60 feet, where they stay for another two weeks. Here new gas burners are being installed to replace the hard coal burners. A new watering trough is also being constructed.

Uses Straw for Insulation

The building's ceiling is covered with a layer of straw held in place with chicken netting. It helps to keep the interior cooler in summer and warmer in winter. Cory says, "We had the straw and the time. It does the job and wasn't as expensive as commer-

Reprinted by permission from Indiana Farmer's Guide, Huntington, Indiana

cial insulating material."

The ducks are later moved to the third and largest building which measures 30 by 100 feet. Here, they are kept until time for marketing. On the south side of the building is a cement pool with a sloping bottom and a maximum depth of 18 inches. It is 12 feet wide and runs the full length of the building.

Fresh water is constantly flowing into the pool at the rate of 1,500 gallons per hour. The pool's outlet empties into a small ditch which extends for several hundred feet across part of Cory's 80 acres before emptying into Turkey Creek.

The ducks keep the water constantly stirred, and most all the manure and sediment flows into the ditch with the water where it settles. When the sediment accumulates to a depth of several inches, Cory changes the course of the water, allows the sediment in the old waterway to dry, then loads it into a manure spreader.

He figures this is much better than fencing in a section of a creek as some duck producers do. His setup saves rather than wastes the valuable manure.

The pool never freezes in the winter because of the southern exposure, heat from the ducks, and the natural warmth of the water. It is drained and cleaned about twice a week during the summer months but less often during the winter. Water pumping costs a low one cent per duck.

Ducks Like Pellet Feed

The feeding program is simple —pellets. These pellets are slightly smaller than rabbit pellets and include all the nutrients needed for good growth and rate of gain. Their current cost is $72 per ton. Cory has tried adding grit and oyster shells to the diet, but the ducks prefer the pellets to any other feed or additives.

Feed is stored in two locations: an open bin near two self-feeders in the second growing house and in large bins in the finishing house. This latter facility can hold up to 60 tons of pellets. Existing facilities allow for storage far beyond the immediate need because Cory usually buys a large amount of pellets when he anticipates a pellet market shortage or a pellet price increase.

Two lots are used for the ducks to run in. The lots are covered with corn cobs. As the manure accumulates, more cobs are added to prevent feather burn (loss of feathers because of manure acid). After about three years, the manure and cob layers are 2 to 3 feet thick. This material makes excellent fertilizer. About 200 loads of manure and decomposed cobs are spread every year.

When available, wood shavings are used as litter for the young ducklings. The shavings are more

absorbent than either cobs or straw and make up a portion of the fertilizer applied on Cory's 80 acres.

Markets Ducks Locally

Cory formerly marketed his ducks in Chicago. However, he now sells to a duck processing plant only three miles away with a capacity of 10,000 to 20,000 ducks. He receives about 21.5 cents per pound from the local plant. Shrinkage (8 to 10 per cent in summer, 5 per cent in winter) and transportation expense (3 cents per duck) are mostly eliminated by selling locally instead of on the Chicago market.

Duck prices are seasonal with lower prices prevailing during the summer and higher prices during the fall and winter months. Regardless of this price pattern, Cory operates on a year 'round schedule. He plans to market 20,000 this year. Past yearly production has run as high as 25,000.

Time of marketing is probably more critical with ducks than with most any other farm product. They must be marketed within three or four days of the 7½-week age mark. If not, they must be kept for an additional four weeks—a losing proposition. When ducks reach this age, they begin to lose their breast feathers and in their place grow small pin feathers. Processors won't take ducks which have pin feathered. After another four weeks, the reverse happens. Larger feathers replace pin feathers.

Cory's biggest problems are owls and rats. They are natural enemies and can destroy many ducks in a few minutes. Disease is not a problem in this operation because Cory maintains all buildings in a spotlessly clean condition. Disease can take its toll the same as in other poultry enterprises.

Cory has also raised chickens. He says, "I like raising chickens but I'd rather raise ducks because of their good disposition. Two men can easily run 2,000 ducks from one lot or building to another."

It would be a mistake for anyone to believe that there are large profits in duck production. Markets are extremely limited and, according to Cory, duck raising demands c o n s t a n t attention. More time is spent in just seeing that things are all right than in the actual feeding and marketing operations. It's not a business for amateurs.

There are also many things to be learned from experience. Cory says, "It takes years and years to find out what to look out for. We still have a lot to learn after 26 years."

Red Ink, Rich Earth and The Reckoning

Government's ballooning farm expenditures have helped wreck hopes for a balanced budget . . .

Condensed from Newsweek Magazine

ONLY seven months ago, Administration officials were cheerfully predicting a balanced budget for fiscal 1959, estimating a surplus of some $500 million.

In early July, as the new fiscal year began, the dismal fate of that particular forecast was all too plain to see.

In a weekly press conference, President Eisenhower officially confirmed what his economic experts have been brooding about openly. The government will probably operate at a deficit of some $10 billion in the year ahead, more than treble the red ink in the year just ended and the biggest peacetime deficit in U.S. history. What's more, said the President, the deficits were virtually sure to continue at least through fiscal 1960. The date for another balanced budget was so remote that it couldn't be guessed.

The President pointed out that revenues were "down considerably because of the recession" (Treasury receipts are expected to drop well below $70 billion, compared with $71 billion in the balanced-budget fiscal year of '57). But even if the economic recovery produces the expected upturn in tax collections, he admitted, the government would still be a long way from the happy side of the ledger.

What's running up the bills?

The boost in defense outlays is a major item of course; defense spending is now calculated at $40.8 billion for fiscal '59, which is $1 billion over the January forecast. Inflation has added to the projected cost of the Federal highway program, and government workers have gotten a $540 million increase in pay. Boosted Federal housing costs, appropriations for unemployment compensation, and other anti-recession measures will help push the total at least $5 billion above expectations—into the $78-$80 billion range.

Help for Farmers

Of all the spending bulges,

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however, none causes more consternation nor seems more paradoxical than the government's ballooning farm expenditures. With farm income running at a $36.5 billion rate in the first quarter, highest since 1952, the Department of Agriculture expects to spend a record $6.5 billion helping out farmers in the next year vs. a $5 billion estimate made in January. Nearly all the $1.5 billion boost will come from higher subsidies — now pegged at almost six times the 1952 levels.

One big reason: Bountiful growing weather. The record crops that have filled farmers' jeans have frustrated the government's efforts to cut back farm production with its soil-bank program and promise to add to its support burden by halting the farm-price rise. (A bumper wheat crop, running some 34 per cent above 1957 levels, recently dropped cash prices at some Kansas grain elevators to the lowest point in fourteen years.) Abetted by Congressional generosity, the weather has boosted price-support loans by $400 million over the January forecasts. Congress has added $250 million to appropriations for the soil-bank acreage, almost all of it to be paid out in fiscal '59. Inspired by anti-recession fever, it has added more millions for such programs as Farmers Home Administration loans.

Help for Exporters

The biggest item among the farm-support "extras" is an $800 million appropriation to be paid to cotton and feed-grain exporters to help them market surplus crops abroad. By sowing these seeds of debt now, Agriculture Secretary Ezra Taft Benson hopes to reap bigger savings in fiscal 1960 and later—when, presumably, reduced domestic surpluses will save the government this much or more in support costs.

Putting forage up as grass silage can help cut field and storage losses of nutrients by as much as 60 per cent. Only about two-thirds of the potential feed nutrients from an acre of alfalfa-brome grass harvested as field-cured baled hay reach the cow.

While Budget Bureau and Agriculture Department officials may trim $500 million in "fat" from farm appropriations by the time they make their formal budget revisions in early September, their hope for real savings depends on bad weather—at best an undependable ally. At worst, it could start another vicious circle: Bad weather that cuts crops between now and harvest time might save support money, but might also start farmers pressuring Washington to help them make up their losses.

How To Increase the Lamb Crop

A comprehensive article . . . everything from selecting ewes to care of the ram . .

Condensed from
National Live Stock Producer

Stewart H. Fowler,
State College of Washington

THE lamb crop is the most important single factor in making a profit in the sheep business. When the lamb crop is short, the income from the flock is correspondingly small.

Number of lambs raised per 100 ewes of breeding age will vary widely from less than 60 to 80 or over in the Western range flocks to as high as 160 in farm flocks in the Midwest. This wide variation is due to differences in breeds and conditions under which the sheep are raised. The lamb crop percentage can be influenced to a considerable extent by the sheep producer's management practices.

First, plan ahead so you will be ready to breed when the time arrives. Successful sheepmen refrain from changing the environment and feed of animals just prior to the breeding season. New additions to the flock or band are made long before breeding time so animals can become accustomed to their new environment and be properly conditioned for breeding.

Sheepmen Need Rugged Ewes

Sheepmen need a rugged ewe with lots of size for commercial lamb production. They want a ewe that is large enough to develop, carry, and drop a big, husky lamb; a ewe with capacity to consume enough feed to produce sufficient milk for a top market lamb. Under satisfactory conditions, the ewe should produce a market lamb weighing approximately 90 pounds at not later than 150 days.

The ewe that is refined about the head and neck, and has a roomy middle, a broad rump, and good udder development, is usually a reliable breeder, whereas ewes that are extremely coarse and lacking in femininity are often barren or uncertain breeders. Quiet, motherly dispositions are valuable, because nervous and excitable ewes may cause

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serious losses at lambing time. On the other hand, ewes that are too sluggish may fail to give necessary care and attention to their lambs.

Wool-blind ewes have difficulty in finding all the feed they need, especially on Western ranges where grass is sometimes scarce. They usually produce fewer lambs per ewe, weighing less at weaning, than open-faced sheep. Production of open-faced ewes at the USDA's Sheep Experiment Station, Dubois, Idaho, has averaged about 75 pounds of lambs per year, or 11 pounds more liveweight than wool-blind ewes. In general, Western sheepmen figure that it takes the first 50 pounds of lamb a ewe produces to pay production costs. Thus, open-faced ewes yielded a net return of 25 pounds of lamb, or fully 78% more than wool-blind ewes that weaned only about 64 pounds of lambs per year.

There are both advantages and disadvantages in buying yearlings and two-year olds, or older ewes. In general, yearlings are preferred. Normally, there is a wider selection available, and a yearling ewe generally can be considered sound in udder and teeth. If something goes wrong the first year, the ewe is still young enough so that she has several more productive years ahead. A yearling will have fewer twins than older ewes, and there may be a little more difficulty at lambing time. With older ewes, the problem is in getting them sound. Their length of productive life ahead is uncertain.

Fertilizer prices have increased only a small amount in the past 20 years, while the average cost of all other farm production items rose nearly 2½ times.

There is much difference in the degree of prolificacy in ewes of different breeds and in different strains in the same breed. Fine-wool ewes are less prolific than medium-wool mutton breeds. The variation of different strains within a breed is well illustrated by the Rambouillet. In the farm states where twins are considered desirable, Rambouillet breeders have developed flocks that normally produce a high percentage of twins. Under range conditions or in areas where grazing conditions are poor, twins are seldom wanted, and sheepmen have selected for single lambs to the extent that the percentage of twins is comparatively small in many flocks of range Rambouillets.

Environment is Important

Estimates of heritability of prolificacy in sheep are only 10 to 15%. This means that such

environmental factors as feed, water, temperature, and snowfall have a greater effect on the number of twins born than does the inheritance of the ewes. Thus in spite of the economic value of twins under some conditions, present evidence does not indicate that major attention should be given to twinning traits in sheep unless the producer definitely favors twins. A small but consistent gain accomplished through selection can amount to a substantial increase over a period of years.

For each 100 ewes, 18 to 20 of the best ewe lambs should be kept as replacements. This will allow for replacement by death, ewes removed because of age, and culling of the younger breeding stock.

With the exception of valuable purebreds, it does not pay to retain ewes that go through a breeding season without getting with lamb unless there is some apparent reason for their not breeding. Certainly the ewe that misses two seasons in succession should be disposed of if the average lambing percentages for the flock have been greater than 70%. If lambing percentages are over 90%, all ewes failing to rear lambs probably should be culled.

You will find it pays to examine the udders of ewes prior to mating and to consider for culling ewes with defective udders, abnormally large teats, or blocked teats. Even if such ewes produce healthy lambs, the chances of the lamb's survival are greatly reduced.

When out on the highway, drive like porcupines make love —very carefully!

The most desirable age for breeding ewes is from two to four years. Mutton ewes start on a decline at about six years of age and wool breeds at seven years. Range sheepmen prefer to cull before these ages because of the rigorous life range ewes encounter.

It is not a good practice to breed ewe lambs. The early breeding may stunt their growth, and there may be more losses at lambing time. Under farm conditions, however, where lambs are dropped in December and are well developed by the following fall, it may be profitable to breed ewe lambs and gain a year in productivity. Special feed and care will be needed during pregnancy and lactation, because the ewes have not attained their full growth.

Success Depends on Feeding

The kind of job that you do in feeding and caring for the ewes during the winter will great-

ly determine the success of the sheep enterprise. There are five nutrient elements which must be present in any ration for any type of live stock. These elements must be in proper proportion and in adequate amounts. The nutritive elements are carbohydrates, or energy feeds; proteins; minerals; vitamins, and water.

Sheep are ruminants and can get the carbohydrate or energy needed in a ration from roughages and grain. The main thing in providing energy feeds is to provide an adequate amount. Ewes will eat from 3 to 4% of their body weight in dry matter each day. When fed hay alone, they will sometimes eat a higher percentage. A 150-pound ewe will normally eat from 4 to 5 pounds of dry feed per day.

Sheep can obtain needed protein from legume hays or from the addition of such protein feeds as cottonseed, linseed, or soybean meal. The requirements for protein are not especially high, but it's very essential that you feed adequate amounts to insure proper development of the lamb and to insure good condition of the ewe and an adequate milk supply.

Minerals are necessary for building bone, developing teeth, and for other important functions of the body. Low phosphorus in the feeding regimen of breeding ewes must be avoided if the condition of the ewes is to be maintained and a high-percentage lamb crop secured. A mineral mixture made up of two parts steamed bone meal and one part iodized salt and loose iodized salt provided in addition will usually meet all of the mineral requirements needed for sheep production.

Vitamin A is the only vitamin likely to be short in the ration for ewes. All the rest are either found in the feeds or are manufactured in the rumen. Vitamin A, normally derived from green feed, is necessary for optimum fertility. Normal body stores of Vitamin A are depleted slowly. The absence of sufficient quantities of green grazing over too long a period, as may occur in dry years, may result in depletion of Vitamin A and can become a serious factor in lamb mortality. Vitamin A will generally be supplied in adequate amounts by any good quality legume hay properly cured, if it still maintains its green color and is not over a year old.

Flushing of ewes, a condition brought about by changing the ewes to better pasture or by feeding of grain so as to cause the ewes to gain in weight, is a practice that will increase the number of twins born. Flushing also helps to bring the ewes into heat so that they may all be bred within a short period of time.

Flushing may be accomplished by placing the ewes on a good pasture for 10 to 14 days before turning them with the rams. If succulent pasture is not available, the ewes may be flushed by feeding them one-half to three-fourths pound of grain per head daily. Whole oats or a mixture of equal parts by weight of corn and whole oats are satisfactory rations for flushing. Flushing will be more effective if the ewes are thin than if they are in good flesh.

Raising children is like making biscuits: it is as easy to raise a big batch as one, while you have your hands in the dough. E. W. Howe

Treat Sheep for Parasites

The condition of ewes at mating time is important. Ewes that are in rugged condition and firm in flesh without excess fat are in the best condition for efficient breeding. An over-fat ewe may be difficult to get in-lamb, although an over-fat ewe is not necessarily a poor breeder.

If sheep have internal parasites at breeding time, they will not settle properly. As a result, the lambing period will be longer. Also, there will not be as many twins and the lambs will be weak. Heavily infested ewes will have trouble producing enough milk to raise their lambs.

A mixture of one part of phenothiazene to nine parts of salt will assist in the controlling of stomach worms if the mixture is kept in front of the sheep at all times. It's also a good idea to drench the ewes with phenothiazene in the fall. Give two 12.5 gram boluses two weeks before you put in your rams.

A vigorous ram from one to four years of age is sufficient for 35 to 40 ewes when allowed to run with the ewes day and night. A ram lamb may be used on a small flock up to 20 ewes if he is vigorous and well grown and if turned with the ewes only at night. Practical sheepmen say that older rams tend to walk through the ewe band hunting for those in heat and will breed each ewe only once, whereas yearling bucks tend to stay with a particular ewe found in heat, thereby breeding fewer ewes during the season.

A good breeding ram is vigorous, strong, and active. A ram that is too fat will be lazy and inclined to stay in the shade and fail to get his ewes bred. Hence, it will be necessary to starve him down some before breeding. On the other hand, a ram that is too thin will produce weak sperm and will settle few ewes.

Get Ram Ready for Breeding

The ram should be conditioned for the breeding season, so that he will be vigorous, active and

thrifty but not excessively fat. Beginning about two or three weeks before and during the breeding season, it is advisable to feed rams about 1 to 2 pounds of concentrates per day. Whole oats may be used, or the oats may be supplemented with bran and linseed oilmeal, using 3 pounds of wheat bran and one pound of linseed oilmeal with 6 pounds of oats. Also, equal parts of whole oats and rolled barley make a satisfactory ration. In addition to the concentrate, the ram should receive about 2 pounds daily of good hay.

If a ram is put in service while the weather is still warm, it is a good practice to shear him before breeding. Shearing the ram will cause him to be more active. There is also less likelihood of temporary sterility, and it will be easier for the ram to cover his ewes. The ram may be sheared entirely except for the wool on the brisket, which should be left so that paint or dye can be used on the brisket to mark the ewes when they're bred. If the ram is not shorn out clipping the wool short on the belly for several inches in front of the sheath will make mating easier and surer.

Breeding records may be obtained if you will paint the breast or brisket of the ram in the area between the forelegs every day or two with a dye mixed in motor oil which will not stain the wool. As the ram serves a ewe, a mark will be left on her rump. By changing the color every 16 days, it can be determined whether the ewes that have been bred are returning in heat. Ewes remain in heat from 1 to 3 days, and if not bred repeat in from 13 to 19 days, usually averaging about 16 to 17 days.

There are two methods of checking on the fertility level of the male. One is the performance of the ewe flock and the observed need for rebreeding. A second is by microscopic examination of the ram's semen. A third method is currently under investigation by research workers; by palpating the tests it may be possible to distinguish between rams that are fertile and those that are infertile.

Although some ewes will breed at almost any time of the year, the natural breeding season is late summer and fall. With the first cool nights of late summer and the decreasing hours of daylight, ewes begin to come in heat. Prior to this time, it is a good practice to trim the wool and tags around the dock of the ewes. Ewes sometimes go unbred because the wool or tags around the dock prevent the ram from making satisfactory service.

The mating season should be long enough to give all ewes at least two chances of mating. Five weeks is a minimum period, and

6 weeks is preferable. Common practice is to allow the ram to run with the ewes during the breeding season. If an old or rather young ram is used, however, better results may be obtained if he is allowed to run with the flock only at night.

When a large band of ewes is run together, as on the Western ranges, the "relay method" is a recommended practice. One half of the usual number of rams are run with the ewes for the first two weeks of the mating season. They are then removed, and the second half of the rams are put in with the ewes. The first group of rams is allowed a rest and good feed for a period of two weeks, and they are then placed back with the band for the breeding season to be completed with all the rams with the ewes.

About three weeks before the ewes are due to lamb, it will pay to clip the wool from the udder, the flank and up to the dock on all ewes. This will keep the lamb from eating wool, a habit which sometimes results in death because of "wool ball" formation in the lamb's stomach.

As the ewe approaches lambing, she will appear restless and will look sunken in front of her hips. When this is observed under farm flock conditions, the ewe should be placed in a lambing pen, or claiming pen. Two 10-foot hurdles that are hinged in the middle can be put together to provide a pen five feet square. The use of the lambing pen will prevent other sheep from tramping on the new-born lamb, keep them from wandering away and becoming chilled, and will also lessen the danger of the ewe not claiming her lamb.

Americans have more autos than telephones or bathtubs.

Dry Newborn Lambs Promptly

At the time the ewe is placed in the lambing pen, the grain allowance should be materially reduced, but good quality dry roughage may be fed free choice. After lambing, feed very little grain for the first two or three days to avoid udder trouble.

If the ewe lambs during cold weather, dry the lamb promptly with burlap or cloth. Then be sure the lamb nurses within half an hour after it's born. This will result in fewer chilled lambs. Apply tincture of iodine to the lamb's navel soon after birth to prevent infection.

Lambing time is the most critical time of the year in the sheep enterprise. The way that ewes are handled at lambing time can either retain or lose all the advantage gained from careful planning for an increased lamb crop and may easily make the difference between profit and loss.

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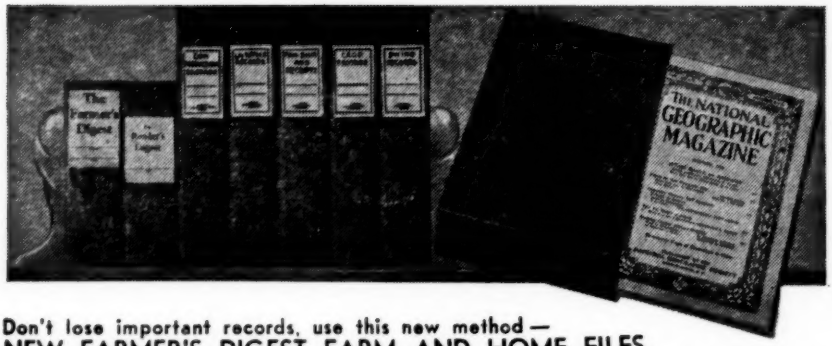

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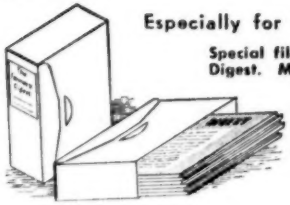

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